CHANGING COURSE: MID-WESTERN PRIMARY-GRADE TEACHERS' PERCEPTION AND USE OF iPADS FOR CLASSROOM INSTRUCTION

A DISSERTATION

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY IN EDUCATION

BY

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BALL STATE UNIVERSITY

MUNCIE, INDIANA

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ABSTRACT

DISSERTATION: Changing Course: Mid-Western Primary-Grade Teachers' Perception and Use of iPads for Classroom Instruction

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The purpose of this study was to examine K-2 teachers' use of iPads during classroom instruction in one mid-western state. It specifically sought to see if, how, and when K-2 teachers were using iPads in their classrooms. In addition, this study analyzed teacher perceptions in regard to the use of iPads in the classroom, and examined demographic data to determine relationships between these variables.

Participants were K-2 teachers from both private and public schools, and 1,528 respondents completed the survey. The survey was emailed to 9,618 teachers via Qualtrics three times over a four-week period in the spring of 2014. General findings indicate that 68% of respondents have access to iPads in their classrooms, and an additional 2% use other types of tablets. Most classrooms have fewer than 10 tablets/iPads that are used five or fewer times per week. Many classrooms have only one teacher iPad whose main use is for assessment and data collection. iPads are mostly used for language arts, followed by math, science, and social studies. Teachers often use iPads for inquiry learning and differentiation. There is a need for more professional

development prior to school adoption of iPads. Teachers find iPads motivating and engaging, and most importantly they help students learn.

Chapter1: INTRODUCTION

Context

Literacy teachers have been challenged with the responsibility to integrate technology in their teaching. As discussed below, the following position statements from the International Reading Association, National Council of Teachers of English, and International Society for Technology in Education put in context what is expected from literacy teachers in today's networked age.

Background Information

In 2009, the International Reading Association issued a position statement that "literacy educators have a responsibility to integrate information and communication technologies (ICTs) into the curriculum, to prepare students for the futures they deserve" (International Reading Association, 2009, para. 2). Although the responsibility of integrating ICT's into the curriculum falls on literacy teachers, until the testing requires it, most teachers will continue with the status quo (Leu et al., 2011). The National Council of Teachers of English (NCTE) updated their definition of 21st century literacies in February 2013. It states:

> Literacy has always been a collection of cultural and communicative practices shared among members of particular groups. As society and technology change, so does literacy. Because technology has increased the intensity and complexity of literate environments, the 21st century demands that a literate person possess a wide range of abilities and competencies. These literacies are multiple, dynamic, and malleable. As

> in the past, they are inextricably linked with particular histories, life possibilities, and social trajectories of individuals and groups. Active, successful participants in this 21st century global society must be able to
>
> - Develop proficiency and fluency with the tools of technology;
> - Build intentional cross-cultural connections and relationships with others to pose and solve problems collaboratively and strengthen independent thought;
> - Design and share information for global communities to meet a variety of purposes;
> - Manage, analyze, and synthesize multiple streams of simultaneous information;
> - Create, critique, analyze, and evaluate multimedia texts;
> - Attend to the ethical responsibilities required by these complex environments (para. 1)

The International Society for Technology in Education (ISTE) has issued a position statement in regard to the Common Core State Standards and technology.

> ISTE believes digital learning plays a central and substantive role in ensuring all students graduate college and career ready. Technology, used effectively, can help all students meet and exceed the rigorous learning goals embedded in the Common Core State Standards by providing access to tools and resources that personalize instruction and creating rich, engaging and relevant learning environments (para 1).

These position statements stress that technology must be used effectively to prepare students for their futures. A literate person must be able to navigate literacies that are multiple and changing. They go beyond the printed text and involve multimodal

elements such as symbols, sound, and context. These elements are all part of navigating an iPad. However, current policy does not align with recommendations for technology in literacy instruction. With the emphasis on standardized testing, teachers are going to focus their instruction on the content of standardized tests. Currently, online reading is something that is not addressed on standardized testing. Teachers are not able to take the time to teach online reading skills to their students when other testable content needs to be addressed (Leu et al., 2011). Coiro & Dobler (2007) suggest reading online text that involves hypertext and is multimodal requires different reading skills in order for comprehension to take place. Coiro has also assembled an assessment measure called the Online Reading Comprehension Assessment (ORCA) to test proficient comprehension in online reading. However, it is generally not used because online reading skills are not on standardized tests.

Technology has entered schools at a much slower pace than the workplace. Schools tend to be conservative and want to have proven, reliable technology before it is embraced (Geist, 2011). On the flip side, schools want to prepare students for jobs that have yet to be invented. This creates a problem of whether teachers should employ the traditional just-in-case learning where students are given a variety of information about many topics whether they need it or not, versus the contemporary just-in-time learning where students access information as needed (Geist, 2011). Gone are the days of lengthy research to answer a simple question. In fact, streaming media allows for today's learner to access information when he or she wants or needs it (Geist, 2011). This is different than the traditional pedagogy that is one-size-fits-all and teacher focused. This type of instruction caters to the masses and provides information "just in case" it is needed. The

theoretical framework that supports the integration of digital technology into both literacy and the content areas is the Technological Pedagogical Content Knowledge (TPACK). TPACK refers to how teachers effectively integrate technology in classroom instruction (Hutchison, Beschorner, & Schmidt-Crawford, 2012). When the TPACK framework is utilized, "the iPad may help teachers meet traditional print-based literacy goals while also providing student with opportunities to learn the new literacies of 21st-century technologies by responding to texts in unique ways" (Hutchison et al., 2012, p. 16).

Students of the Net Generation have grown up in a digital world that is used to collaboration, conversations, and group work. The Net Generation is used to getting information when and where they want it; in another words, learning happens when it is needed, or just in time. However, tensions are arising between the two aspects of traditional context-bound education and informal mobile learning. Young people continue to perceive school learning as irrelevant to their skills and interests (Geist, 2011). They are used to having access to just about anything from anywhere, and are used to the technological tools that promote teamwork and collaborative learning. The heart of this conflict seems to be within the technology itself.

Statement of the Problem

There is much on-going research on new technologies and their effects on teaching and learning. The kinds of studies that produce meaningful data often take several years to complete—a timeline that lags far behind the fast pace of emerging and evolving technologies (Education Week, September 21, 2011). In addition to research that ages quickly, technology often becomes obsolete before all of its benefits can be realized. Cuban (2001) found that computers exist in schools, but they are often

underused. Teachers generally use the technology for low-level work such as word processing. Administrators often push technology in schools, because there is a perception that schools with the newest technology are better at preparing students for their futures. However, simply having technology in schools does not mean teachers are ready to use it to its full potential. Pedagogy is slow to change (Felvegi & Matthew, 2012). Further, teachers cannot take full advantage of all technology has to offer without the proper training (Larson, 2012). Professional development sometimes comes after, if ever, technology is brought into the school.

Tablet computers, more specifically the iPad, are making their way into schools. Some schools are even contemplating replacing textbooks with the iPad. According to a *USA Today* article published in 2011, nearly 600 school districts in the United States are going one-to-one iPad, eliminating the need for textbooks. According to the article, not only is the bulkiness of the backpack eliminated, students are always privy to the latest information via the iPad, unlike some textbooks that become obsolete after print. This statistic is constantly changing as schools continue to adopt the iPad. For example, the department of education in Indiana asks schools to self-report 1:1 iPad use in the state. As of March 28, 2014, 45 school districts had reported 1:1 iPad use (http://www.indianaelearning.us/map/). In just three years, 1:1 iPad use has gone from 600 districts nationwide to 45 districts in just one state. The problem is that research has not been conducted to understand teachers' use and perceptions of iPads in the classroom, especially in the primary grades. According to Garry Falloon, a New Zealand educational researcher, "As the use of these devices (the iPad) is still very much developing research-wise, there's not a lot of empirical studies out there. What exists is

generally as you identify -anecdotes and some basic teacher stories and vendor hype" (G. Falloon, personal communication, December 16, 2013). Therefore research is needed in regard to the iPad to make sure an investment in this new technology is not underutilized.

Purpose of the Study

The purpose of the study was to examine teachers' use and perceptions of iPad use in their classrooms. It is critical to know when and how iPads are being used with young children, particularly in kindergarten through 2nd grade. Beginning studies have touted the benefits of the iPad as an engaging tool for young learners, but more information is needed in regard to curriculum. The specific research questions are as follows:

1. Do kindergarten, 1st, and 2nd grade classroom teachers in a mid-western state use tablets/iPads in classroom instruction?
2. When do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
3. How do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
4. How do K-2 teachers in a mid-western state perceive the use of iPads for classroom instruction?

Definition of Terms

For the purpose of this study, the following are definitions of terms that will be used:

Applications (apps)- App is short for "application," which is the same thing as a software program; it is most often used to describe programs for mobile devices,

such as smartphones and tablets. Apple popularized the term "app" when the company created the "App Store" in 2008. As the iPhone and App Store grew in popularity, the term "app" became the standard way to refer to mobile applications. (www.techterms.com)

Assessment- the act of making a judgment about something: the act of assessing something; an idea or opinion about something; an amount that a person is officially required to pay especially as a tax (http://www.merriam-webster.com/dictionary/assessment)

Digital immigrant-an individual who was born before the widespread adoption of digital technology. The term digital immigrant may also apply to individuals who were born after the spread of digital technology and who were not exposed to it at an early age. Digital immigrants are the opposite of digital natives, who have been interacting with technology from childhood. (www.technopedia.com)

Digital literacies-term used interchangeably with new literacies (Knobel & Lankshear, 2007)

Digital natives-A digital native is an individual who was born after the widespread adoption of digital technology. The term digital native doesn't refer to a particular generation. Instead, it is a catch-all category for children who have grown up using technology like the Internet, computers and mobile devices. This exposure to technology in the early years is believed to give digital natives a greater familiarity with and understanding of technology than people who were born before it was widespread. (www.technopedia.com)

Engaged readers- defined by John Guthrie and the NRRC, are those who apply reading strategies for comprehension and conceptual knowledge, are motivated to learn and achieve, and who are part of a supportive literate community (Guthrie & Wigfield, 2000)

Flipped classroom- The flipped classroom is a model of teaching in which a student's homework is the traditional lecture viewed outside of class. Then class time is spent on inquiry-based learning, which would include what would traditionally be viewed as a student's homework assignment. Synonymous with *Reverse Classroom.* (http://www.flippedclassroom.com/help/definitions.php)

Hypertext-Hypertext is text that links to other information. By clicking on a link in a hypertext document, a user can quickly jump to different content. (www.techterms.com)

Inquiry-based learning- an approach to teaching and learning that makes intellectual engagement and deep understanding possible through a hands-on, minds-on approach towards the curriculum. (www. http://www.thinkinginmind.com/2011/08/what-is-inquiry-based-learning/)

iPad-a tablet computer made by Apple, smaller than a laptop, but bigger than a smartphone, it has a touch keyboard, it runs on Apple's IOS system, it has eReaders capabilities and WIFI access. (www.techterms.com)

New literacies- are "participatory," "collaborative," and "distributed" in nature. They are also less expert and rule dominated than established literacies. (Knobel & Lankshear, 2007)

Perception- the way you think about or understand someone or something; the ability to understand or notice something easily; the way that you notice or understand something using one of your senses (http://www.merriam-webster.com/dictionary/perception)

Social media- Social media is a collection of Internet-based communities that allow users to interact with each other online. Some examples include Facebook, Twitter, and Pinterest; most social media websites also provide custom apps that make it easy to view and post updates while on-the-go. (www.techterms.com)

Technology- the use of science in industry, engineering, etc., to invent useful things or to solve problems: a machine, piece of equipment, method, etc., that is created by technology (http://www.merriam-webster.com/dictionary/technology)

Tablet computers- A tablet, or tablet PC, is a portable computer that uses a touchscreen as its primary input device. Most tablets are slightly smaller and weigh less than the average laptop; an iPad is an example. (www.techterms.com)

Touchscreen- touchscreen is a display that also serves as an input device; most modern touchscreens detect human touch. Since touchscreen devices accept input directly through the screen, they do not require external input devices, such as mice and keyboards, which makes touchscreens ideal for portable devices, such as tablets and smartphones (www.techterms.com)

Significance of the Study

This study is important due to the fact that iPad use in education is new, and few empirical studies have been done. It is important to know if teachers are using iPads, and to know how and when they are using them in their classrooms. Teacher perceptions

about different aspects of iPad use are also important to know. This study is significant, as it will provide a base to determine the feasibility, importance, and longevity of the iPad in classroom instruction. Through the use of this data, administrators and teachers may understand how and when the iPad contributes to reading education, and whether or not they should be purchased and used in their schools.

Assumptions of the Study

There are two assumptions from this study. K-2 teachers who received the survey answered the survey honestly and to the best of their ability. It is also assumed that the state Department of Education provided a list of schools that contained K-2 classrooms.

Limitations

There are several limitations to this study. One limitation is that participants came from just one mid-western state. Secondly, the assumption is that the state supplied the researcher with a complete list of K-2 schools with related teachers and administrators. Although the state department of education website has a map that includes schools using iPads, the data is self-reported, thus not all schools are represented. This map represents only schools with 1:1 iPad initiatives. This excludes schools that may have 2:1 iPads, iPad carts, partial iPad sets purchased through grants, etc. Therefore, in order to be more thorough, the researcher requested a full list of all K-2 teachers and their administrators. Thirdly, all portions of the state were represented in this study; however, statistical analysis of this was unable to be performed due to the response rate and the lack of data gathered asking respondents to share their regional location. Lastly, surveys in general have limitations. Questionnaires are optional, and

the majority of people who receive them do not complete them (Leedy & Ormrod, 2013). Those that do return them do not necessarily represent the intended sample. The participants' responses will represent their literary skills, and they may misinterpret one or more of the questions.

Summary

The iPad is a learning tool that administrators and teachers are bringing into the classroom. As a result, it is important to examine how and when teachers are using iPads for instruction. Teachers are ultimately the ones who decide what tools to use in their instruction, therefore it is important to know teachers' perceptions of iPads in addition to how and when they are using them in instruction. However, there are very few empirical studies looking at iPad use in the classroom. This study will provide valuable information to both teachers and administrators who are currently contemplating embracing iPad technology, and bringing them into their classrooms and schools.

Chapter 2: REVIEW OF LITERATURE

Introduction

Teachers in schools today have a variety of technological instructional tools available to guide their students' learning. However, schools struggle to keep up with the rapid technological changes available for classrooms, and often the education system does a poor job considering the needs of learners and adapting curriculum and delivery to meet those needs (Geist, 2011). Because young children enter school more techno-savvy than those before them, they are forced to leave their technoliteracies at the classroom door (Wohlwend, 2010). Even when schools provide technology it does not mean it is used (Cuban, 2001) except for word processing and other low-level applications. Presently, administrators are contemplating bringing tablet computers, more specifically the iPad, into the classroom. However, it is not evident if educators will embrace the iPad. The purpose of this study was to explore K-2 teachers' perceptions of iPad use for instruction in their classrooms.

Exploratory studies such as this are essential to define instructional aspects needed to prepare preservice teachers for practice in a technology-rich classroom environment (Karchmer, 2001). The future will determine whether the iPad becomes an important part of the historical aspect of reading instruction or a passing fad.

Historical Background

Machines were first used in literacy instruction as early as 1809 (Lockee, Moore, & Burton, 2004). Generally they were used for test administration. The work of Sidney Pressey is credited as the first formal attempt at programmed instruction. Pressey originally wanted to free teachers up from some of the administrative tasks of teaching,

such as grading, so they could do more actual teaching. He sought to automate some of the mundane tasks of teaching. He also included a feature that would change his machine from only testing to teaching. An educational professional could flip a switch on the machine that would change the device from an automatic testing machine to an automatic teaching machine (Lumsdaine, 1965). The device would not move to the next question until students answered the previous question correctly. According to McDonald, Yanchar, & Osguthorp (2005), Pressey's research ended in 1932 due to the Great Depression, as well as lack of acceptance from educators. In recent times, some educators have still not embraced technology.

In 1954, B.F. Skinner touted the potential of mechanization and programmed instruction (Skinner, 1986). He used 4th grade math instruction as an example (Baker, 2010). He conjectured that machines might solve some traditional problems in education. Some examples include teachers' use of ineffective methods of classroom management, as well as teachers failing to provide quick feedback to students (McDonald et al, 2005). Skinner noted that teachers presented large amounts of material at once and expected students to make unreasonably large behavior changes quickly. This went against his theory of operant conditioning, and his solution was the teaching machine. The teaching machine would present material in smaller increments and offer reinforcement for learning. There was some early success with programmed instruction, which suggested that technology, machines, and Skinner's behaviorist principles were a successful combination (Skinner, 1986). Skinner's work provided the groundwork for instructional technology.

Programmed instruction in the 1960s developed from a print-based medium and

employed principles that technology would embrace in the 1980s (Baker, 2010). It employed a behaviorist way of gaining a desired skill, referred to as direct instruction. The instruction was formatted, followed by a sequencing of content. Then it was followed by an assessment system to determine where to start instruction and where to gauge progress. Hence, students worked to a point of proficiency in a series of progressively more challenging skills. As a result, Baker (2010) believed students' responses might cause alternative pathways preprogrammed to promote proficiency. This type of instruction was one component of explicit, direct instruction. It was also the basis for some of the more recent advancements in instructional technology. Over time, contemporary instructional technology still bears a resemblance to Skinner's programmed instruction developed over 40 years ago.

Direct instruction was commonplace, so it made logical sense that software programs would follow suit. These process/product approaches included clear objectives, carefully developed examples, monitoring of student progress, and a movement from guided instruction to independent practice of skills. At first, processing speeds were slow and graphics were primitive. However, time and research led to products with greater appeal. For example, Simon Sounds it Out, by Don Johnson, Inc. was a research-based approach to phonics instruction (Baker, 2010). It allowed for rapid feedback and adaptive instruction for its users due to continuous monitoring. However, the needs of the student should come before the abilities of a technology. McDonald et al. (2005) stated, "when developers of instruction choose a technology, they should also have a ready explanation as to how or why that technology actually contributes to meeting the needs of the situation" (p. 90).

Baker (2010) described the early demise of programmed instruction in the 1960s. First, research was not supporting the superiority of programmed instruction over other methods (McDonald et al., 2005). Many scholars felt that operant conditioning was not as important to student success, and studies promoted traditional methods over programmed instruction. Further, teacher attitude impacted the success of programmed instruction. According to McDonald, et al. (2005), "many teachers felt threatened that programmed instruction was, in a sense, competing for their jobs" (p. 88). Teachers felt they would be replaced by technology because programmed instruction taught to the masses instead of differentiating instruction for individual students. This caused student frustration when some students were unable to keep the same instructional pace as their peers. In the end, it was found that programmed instruction was most successful when teachers adapted it to their own instruction (McDonald et al., 2005).

More sophisticated software applications appeared in the late 1980s. The creation of hypertext and hypermedia environments allowed for technology to create problem-solving programs. An example is Tom Snyder's Decisions, Decisions software (Messina & Landrum, 1995). In Decisions, Decisions Prejudice, students work collaboratively in small groups to make decisions based on information provided within the software and through written material provided by the company. The students act as the "mayor" running for reelection when a man in town wants to open a store with historical items. Some view the items as racist, and the mayor's election rides on decisions made regarding the store. Depending on what decisions students choose to make, the outcome of the election may vary. Although this is not true constructivism, it does begin to shift the control of the student from simple participant to learner as students collaborate to

make decisions. With such developing programs, there appeared to be a shift from behaviorism to constructivism (Baker, 2010). With continuous improvements in technology, users choose what type of programs to use.

The 1990s brought forth the eReader, although the origin of eBooks can be traced back to 1971, which was the beginning of Project Gutenberg, an organization dedicated to digitalizing texts (Connell C., Bayliss, L., & Farmer, W., 2012). The first eReader was a small, hand held device used to read eBooks. The first eReader, Rocket eReader, was released in 1997. Due to the novelty and limited books available, very few were sold. The Sony Reader was considered the first successful eReader. It used the electronic paper display, which made it easier on the eyes and came with 100 free classic eBooks. Amazon invented the Kindle as an improved competitor to the Sony Reader. The Kindle, released in 2007, changed the sales of eReaders dramatically. Although originally priced at $399, according to Connell et al. (2012), the device sold out in 5 1/2 hours and was out of stock for 5 months. They were popular due to their e-ink displays that were designed to look like ink on paper and resembled a book (Connell et al., 2012). Not only could the Kindle read eBooks, it accepted orders for new books and instantly downloaded the book to the eReader (www.ehow.com). The original eBooks were designed to replicate the experience of reading a printed book. "The major difference between the printed book experience and that of the e-book reader is that the e-book readers usually provide a more accessible reading experience; the text can easily be enlarged for readers with poor vision and the lightweight nature of the device means that it is easy to hold" (Moyer, 2011, p. 254).

Computers began to alter the way reading was perceived. Initially, use of eReaders

netted the same results as print text, as text was still presented in a linear way. That changed with the advent of hypertext. Larson (2012) points out that there are some e-texts that can literally change as the reader uses different tools and features. Online text can be more interactive, depending on what the reader chooses to do with it. For example, while reading online text, unknown words embedded in text can be "clicked on" to reveal the definition. This is an example of hypertext. Hypertext is "text that is linked electronically with other information outside the text being read" (Kamil & Chou, 2009, p. 290). Hypertext may elaborate the current text, provide other related text, or support the text. Hypertext can be both helpful and harmful. It can provide additional information, as stated above, but it can also be distracting. One click on a hyperlink can lead to another hyperlink and so on, which may interfere with original text comprehension. Conventional text is linear with illustrations and pictures, but along with hypertext, online text can include pictures, motions, sounds, and videos. These multimedia additions challenge readers to comprehend the original text along with the other information. Readers need to comprehend the original information and integrate all of the other information presented. New skills are needed to do this.

According to Larson (2012), "Common Core State Standards recognize the need to prepare students for future success by embedding rigorous reading standards and calling for literacy learning through the use of technology" (p. 281). This puts additional pressure on teachers to adopt technology in their literacy instruction. Beyond hyperlinks, online books have a myriad of options to make them more interactive by having the text read aloud, games intertwined in the text, or illustrations that seem to come alive.

Digital literacies are making their way into schools. Some schools are even

foregoing textbooks in favor of tablet devices, more specifically, the iPad. Some districts have iPads in their buildings purchased through grants or title funds, while other districts have gone 1:1 iPads, meaning one iPad for every student.

In the 2000s, new terminology was being developed to define reading in the 21st century. The new literacies or digital literacies were terms used interchangeably. Several definitions have evolved including Knobel & Lankshear's (2007) definition, that new literacies must have both new "technical stuff" and new "ethos stuff." "Technical stuff" is described as technical trends and developments that represent a quantum shift from the way things were previously done. As the new phenomena is integrated into literacy practices, they are being seen as new as they involve different values, priorities, perspectives, etc. Knobel & Lankshear (2007) go on to define new "ethos stuff" as from what conventional literacies used to be. For example, new literacies are "participatory," "collaborative," and "distributed" in nature. They are also less expert and rule dominated than established literacies. Researchers are more interested in investigating how digital texts are used effectively instead of simply comparing them to printed materials (Reinking, 2001). One aspect of the iPad is the use of it as an eReader, but with applications and a myriad of other options, the iPad is considered a new literacy with little research related to education. Thus, the next section will examine the development of iPads and lead into their use for educational instruction.

The iPad

The iPad was introduced in January 2010. It was based around a 9.7-inch LED-backlit multitouch display (www.apple-history.com/ipad). It emerged as a format for downloading and reading eBooks. Connell, et al. (2012) describes the iPad as a tablet

computer that functions like a laptop and utilizes a high-resolution LCD. As well as serving as an eBook reader, the iPad has the capability to browse the web and to run Apple's numerous applications (apps). Another benefit of the iPad is that it is portable, affordable, and has a relatively long battery life (Larson, 2012). Although the iPad has only been in the market since 2010, reading and using reading apps has become some of the most popular iPad activities (Moyer, 2011). In May 2011, Amazon.com's sales of digital books surpassed those of print texts for the first time (Larson, 2012). Teachers are finding that iPads promote collaboration among students, as well as differentiated instruction (Ensor, 2012). Teachers choose apps that are most appropriate for individual students. Skill and drill, such as math facts, may be practiced with an application based on behaviorist principles; whereas, a constructivist application may be more appropriate for another type of knowledge acquisition. There are even some studies that say a tailor-made eBook learning system could provide a better individualized learning experience for elementary school students (Huang, Liang, Su, & Chen, 2012).

Even so, teachers are generally not prepared to use new technology in the classroom, nor can they teach children how to use it effectively (Karchmer, 2001). Larson (2012) states, "integrating technology can be an overwhelming and intimidating experience" (p. 281). With the lack of professional development, as well as lack of planning time, many teachers are struggling with the concept of fully embracing iPad implementation. When it is easier to pull a set of books off the shelf, why would a teacher spend his or her valuable time downloading the same books? Many schools also lack Wi-Fi or reliable Internet connections. Larson (2012) says when teachers do embrace technology, they are "continuously challenged to transform reading instruction

in response to constantly emerging and evolving technologies" (p. 281). Research is needed in this area to compare students who use iPads to those who use traditional textbooks with the same material presented to see if there is a difference in learning.

In the meantime, reading continues to evolve. For example, the New Literacies Research Team at the University of Connecticut "has focused teacher attention across K-12 on ways to integrate what is referred to as the new literacies of online reading comprehension into classroom practice" (Wyatt-Smith, & Elkins, 2010, p. 901). They assert there is a difference between literacies practiced at home versus those practiced at school. Many students may know how to play games or download music or applications at home, but they may not know how to perform research. These require different reading skills and strategies. More research is needed on how students inquire on the Internet to know if they can discern legitimate sources from those that are not.

There are many applications (apps) related to reading. Many could be listed, but it all comes back to how this tool, the iPad, is helping students with literacy. Hutchison & Reinking (2011) state that it is "imperative to examine how the tool can help teachers meet curricular goals to engage in what has been termed curricular integration as opposed to technological integration" (p. 312). More research is needed to determine whether the iPad is a fad or is here to stay.

Theory Relevant to Research Questions

Technology in American classrooms coincided with behaviorism. According to Baker (2010), the early devices were simple and applicable to behavior analysis in that they modified complex processes into simple processes that could be introduced, modeled, and reinforced. This coincides with the classic behaviorists: Skinner,

Thorndike, and Pavlov. Skinner's Operant Conditioning Theory dealt with the importance of association in learning. He theorized that human learning is voluntarily enacted. According to Tracy & Morrow (2006), "people actively 'operate' on their environment to produce different kinds of consequences" (p. 36) or operants. Humans learn to behave in certain ways as they interact or operate on the environment. As conditioning continues, the child will consistently display the desired behavior (McDonald et al., 2005).

In addition, learning occurs when individuals combine new knowledge with existing knowledge, a constructivist view. The key is the learner is actively involved in the learning process (Tracey & Morrow, 2006). The three major components of constructivism are: learning is not observable and it takes place internally; learning often results from hypothesis-testing by an individual; and learning results from inferencing (Tracey & Morrow, 2006). Technology that is learner-controlled, problem centered, emphasizes the use of strategies, has divergent outcomes, and has a holistic approach to a complex task makes it constructivism (Baker, 2010). This applies directly to the iPad as the learner constructs knowledge cognitively. Technology promotes social learning. Many schools cannot financially provide an iPad for each student, so students often work with a partner or small groups on iPads. This social learning connects with social constructivism. With iPads, both cognitive constructivism and social constructivism are relevant.

With the advent of the Internet, and school access to it, behaviorism was largely abandoned in favor of cognitive and social constructivism. Offline, slow, and simple technology went well with the behaviorist approach that focused on simple literacy skills.

The Internet is faster, mobile, and has powerful hardware that allows for more complex literacy activity that takes a variety of forms (Baker, 2010). However, this does not mean that the Internet is constructivist only. It can lend itself to both behaviorism and constructivism. It depends on the teacher and student. According to Taylor (1980), the computer can act as a tutor (behaviorist role-student presented with material, student responds, and computer evaluates); a tool (when used to accomplish a task, i.e. research or word-processing); or a tutee (constructivist approach-learner "teaches" the computer through spreadsheets and wikis). In fact, McKenna, & Conradi (2010) contend that, "behaviorist and constructivist pedagogies, notwithstanding their diametric opposition, not only can but must coexist in the Internet era" (p. 47). For students who struggle with both decoding and comprehension, constructivism alone is not appropriate. Research has shown that explicit instruction benefits decoding and is a behaviorist approach (McKenna, & Conradi, 2010). For example, primary students focused on phonics would benefit from a behaviorist intervention, whereas the same primary student working on critical thinking skills may thrive with a constructivist approach. According to McKenna, & Conradi (2010), technology can be best used in three overlapping stages:

1. Systematic, adaptive, skills-based instruction with a behaviorist approach
2. Constructivist applications in which deficits are supported through electronic scaffolding
3. Constructivist learning without the need for scaffolding supports

These do not need to be followed in this particular order, but instead should focus on the needs of the learner. The ultimate goal is that technology applications will show fewer behaviorist characteristics and move toward a constructivist view.

The definition of new literacies takes a social constructivism perspective. Lev Vygotsky is considered the founder of social constructivism. It was not until the 1970s when Jerome Bruner brought his work to the United States that it became prominent and well read. Vygotsky coined the term zone of proximal development which means the distance between the actual developmental level determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance. In other words, what a student can do independently versus what they can do with some assistance. Vygotsky's work put a focus on the importance of children's social interactions with others in regard to learning (Tracy & Morrow, 2006). Many may not think of technology as social, but it depends on what one does with it. The popularity of social media such as Facebook and Twitter shows that people are interacting with other people via the Internet. According to Wyatt-Smith & Elkins (2010), skills in "communicating information via technology are part of what is needed to function as a society" (p. 906).

Today, literacy has been redefined in the realm of new literacies. According to Leu (2010), new literacy theory has been developing on two levels. *New Literacies* are the "broader, more inclusive concept, benefits from work taking place in the multiple lower-case dimension of *new literacies*" (p. ix). In other words, the lower case new theories explore a specific area of new literacies, such as iPads whereas New Literacies (capitalized) has to do with a broader sense of digital literacies. It is important to realize the important links between literacy, technology, and literacy instruction (Karchmer, 2001). A description of the research utilizing iPad instruction follows.

Current Research on How Teachers are Using iPads in K-12 Instruction

Digital Literacies

Digital literacies continue to be a new topic. The annual "What's Hot, What's Not" survey in *Reading Today* lists the literacy topics that have attention, need attention, or should have attention (Cassidy & Grote-Garcia, 2013). Digital literacies remain on the list this year for needing attention. The iPad utilizes digital or new literacies. Many terms have been used to define reading on the Internet, including both digital literacies and new literacies. At this point, it is important to define the terms. The definition of reading has slowly changed over time. Literacy traditionally has included reading, writing, and numeracy, but now also includes digital aspects which range includes multimedia and multimodal texts (Baird & Henninger, 2011). Now literacy is changing faster than ever before. Donald Leu (2011), a pioneer in this field said, "Never in the history of civilization have we seen a new technology adopted by so many, in so many different places in such a short period of time" (p. 5). He identifies three main aspects to consider in relation to technology in education. One is that literacy is deictic as its meaning and nature continually changes. The meaning of literacy changes as new information and communication technologies emerge online, and new social practices of literacy quickly appear. The second factor is that information presented online requires new online reading comprehension skills. No longer is information strictly presented in a linear fashion. Hypertext is just one aspect of digital literacies. Online reading comprehension is a process of problem-based inquiry across many online sources, which requires readers to identify important questions, read online to locate information, critically evaluate online information, synthesize that information, and finally

communicate information. These are all things that can be done with an iPad. Finally, Leu et al. (2011) goes on to say that public policy and assessment discourages teachers from preparing students for online reading ability. Currently, standardized tests in the United States do not assess online reading skills and comprehension. Until these skills are assessed, teachers will continue to focus their instructional time on the skills needed to perform well on standardized tests. As a result, poorer students do not have access to the same technological benefits as the wealthier students. This directly relates to the iPad. This may be changing as the Common Core State Standards seek to prepare all students for college and the workforce. To prepare for life in a technological society, students must have the ability to gather, comprehend, evaluate, synthesize, report, and communicate ideas in order to think critically and solve problems. The iPad promotes inquiry learning and offers the ability to research and problem solve.

Engaged Readers

Teachers want to go beyond teaching children to read. They want to know how to engage readers. Reinking (2001) says it is difficult to define an engaged reader. Simply reading a text does not mean that students are intellectually engaged, as much academic reading is done with little thought. One way to interest readers is through choice of text. With access to thousands of eBooks, the iPad offers choice, which correlates to engagement. According to Wolk (2010), "In 1960, 26% of our information was from print, primarily books, newspapers, and magazines. Today we're reading more words, but only 9% are from print and 30% from computers" (pp. 10-11) which include things such as emails, tweets, text messages, blogs, and texts. Wolk (2010) says that textbooks are the biggest source of reading material in schools, but students least likely to read

them. They are often times assigned by teachers to be read cover to cover, when reference books should be used sporadically. Online research does not entail linear reading, but instead are read as reference materials should be read. In order to motivate students, educators need to tap into engaging, contemporary reading materials, which can be found on the iPad. Moyer (2011) says that reading is one of the most popular activities on the iPad and books, especially children's books, are some of the most popular apps.

Comprehension

Studies have found that static text presented digitally is basically comprehended the same as print text. Connell et al. (2012) used a one-factor, three-condition design with pretest/posttest measures comparing participants' (N=201) reading comprehension after reading the same text presented on a Kindle, iPad, and paper. Connell and colleagues (2012) found the adoption of eBook readers and tablets for use in academic settings have no effect on reading comprehension. As long as the text is presented the same digitally as it is in print, comprehension is not affected. This disregards text that includes hypertext. Sheppard (2011) conducted a study one year after the release of the original iPad. He used mixed methods, and looked at a total of 43 boys aged 11-13 who read text presented in a traditional book and compared it to the same text presented on an iPad. He found there was an increase in engagement when using the iPad, but there was no corresponding rise in achievement. Among young, low readers, comprehension scores actually decreased. Students in the study enjoyed and were motivated by the iPad, but it did not improve comprehension or achievement. Both of these studies suggest that online text does not affect comprehension and academic achievement. However, other studies

have yielded different results.

Harmon (2012) found that the iPad engaged his students. He conducted a classroom study in a high school in Ohio where he teaches English. He struggled with finding appropriate apps, but did find that they allowed for differentiated instruction. Although he published this article in 2012, the research took place in the spring of 2010, shortly after the release of the iPad. Harmon (2012) found that "students with iPad access were more likely to pass the reading portion of the 2011 Ohio Graduation Test, 85% compared to 79% of students with no iPad access in school" (p. 31). Further, students who used iPads improved their reading and writing ability a full grade level above their peers (on average), based on the benchmark test given to students in the spring of 2011. Therefore, his study found that students who used iPads in classroom instruction were engaged and motivated, as well as performed better on standardized tests. It is important to note that Harmon was a teacher-researcher, and this study took place in his classroom. At that time Harmon found few apps to use with his students, but those results may be different today as new apps and more websites that recommend apps for use in education are available.

As more and more research on computers and literacy surface, the consensus is that almost all research shows some advantage of using technology in literacy instruction (Kamil & Chou, 2009). Reading instruction on the iPad individualizes learning, as well as frees up teachers to provide other services. Struggling readers benefit from a large amount of deliberate practice in order to achieve automaticity. Teacher time and other related costs are limited to provide the high level of practice required for struggling readers. In the *New Literacies* (2010), Hasselbring states, "Rapidly advancing

technology offers a powerful way to scale up instruction and deliberate practice for large numbers of struggling readers. Hasselbring goes on to say that when technology is used appropriately, struggling readers can reach high levels of both automaticity and fluency. This can be achieved through work on the iPad.

Inquiry-Based Learning

The iPad promotes inquiry learning, which fosters creative thinking. Rowsell, Saudelli, Scott, & Bishop (2013) looked at iPads as placed resources. The study was an action research approach by a Canadian research team. The team read, blogged, and learned alongside the students. One of the researchers articulated how tablets had altered her teaching. Rowsell found she now learns with her students, and there is a mutual sense of inquiry and interest; therefore, she acts more as an observer rather than a director of student learning. As a result, there was a focus on the social practice of new literacies. Rowsell et al. (2013) continued by saying, "given the opportunity to express their learning, students can be very creative in finding solutions" (p. 357). The participatory nature of the iPad naturally allows students to work together to problem solve and collaborate.

Teacher Perceptions

As we move further into the digital era, it is important to address teacher understanding and perception of digital literacies and digital literacy use (Gerber & Price, 2013). Digital literacies are often foreign to educators, and implementation of technology often is messy. By studying teacher perceptions, a better understanding of literacy instruction emerges.

Hutchison & Reinking (2011) conducted a large-scale survey (1441 participants) of

teachers' perceptions of integrating information and communication technologies (ICT) in literacy instruction. They chose to survey only literacy teachers, more specifically, those literacy teachers who are members of a state or local council of the IRA. Although this survey did not directly address iPads, the findings can be generalized to iPads since the iPad is a type of information and communication technology. Their findings indicate that literacy teachers acknowledge the importance of addressing digital forms of reading and writing as well as obstacles in integrating ICTs into their classrooms; although the teachers did not find it overwhelming. Also noted was that teachers expect administrators to take a part in providing professional development to implement the new literacies. On the down side, teachers view technology in terms of technological rather than curricular goals. More research is needed on teacher perception of technology implementation, not only with ICTs, but also with iPads.

Teachers understand that their students experience technology outside of the classroom. Rowsell et al. (2013) found that students understood the workings of the iPad from using iPhones and iPod touch devices. Just because students are familiar with how the iPad works does not mean they know how to use the iPad in an educational setting. Although many believe that young people are digital natives, they do not use technology in their personal lives the same way it is used in schools. Often times those that are considered natives are actually immigrants when it comes to understanding technology and education. Teachers need to "bridge the gap between in-school and out-of-school literacies" (Gerber, & Price, 2013, p. 52) as they try to build schema in learning. However, the opposite is also true. Student-teacher hierarchies change as students start to see teachers as learners too. Rowsell, et al. (2013) found that iPads have changed how

teachers teach as they have shifted from directors of student learning to observers and inquirers of what their students are doing.

Using iPads with Young Children

Children of the Net Generation have grown up in a digital world and have different thinking processes than their parents (Geist, 2011). Geist goes on to say that children who are digitally immersed absorb information differently than their parents and do not even read a textbook from left to right and from top to bottom. Instead, young children are skipping around on a page or scanning for pertinent information. Educators need to be aware of this and adjust their teaching methods accordingly. This applies to reading on the iPad. A key ally in early education is the applications on the iPad. Even with preschool children, apps are a popular and available new medium that provides educational content. Teachers must take up the challenge of integrating devices in their classrooms, and researchers are needed to document the impact (Banister, 2010). Beyond integrating the devices, educators must have pedagogical styles and instructional materials that can take full advantage of all that the iPad has to offer. Geist (2011) found that faculty acceptance of technology was especially important to the effective use of devices, such as the iPad. Pedagogy needs to evolve to meet the needs of these up and coming young students.

Plowman (2013) sought to dispel myths about young children and technology. She found that young children need a balanced mix of technology-based activity with more traditional books and games. This was in response to a myth that childhood and technology do not mix. The second myth was that young children are digital natives, those who have grown up with technology and feel comfortable using it. This is

contrasted with their parents who, as digital immigrants, have adapted to technology later in life. Plowman found that technology proficiency depended on the family, and young children need support and guided interaction when using technology. It was also found that technology can enhance rather than hinder social interaction. Most children are using some sort of device (such as the iPad) daily, but is does not dominate their lives. Play can be combined with technology to promote learning, but not all interactive media is educational. iPads, with touch screens and portability, allow for ease of sharing and interactivity.

Students must learn the new literacies early if they are going to gain the skills needed in adulthood. Forzani & Leu (2012) say that research and practice have focused on older students, which is puzzling since the ability to read, write, and communicate affect all students, especially young children that need that foundation. This is especially applicable to the iPad. The learning styles of young children benefit from the unique aspects of digital learning and the Internet. Young children construct knowledge through natural, exploratory, and interactive learning. There is little research on digital literacies and primary-aged children. Forzani & Leu state, "it is imperative to integrate new literacies learning into all primary grade classrooms" (p. 421). Forzani & Leu continue by saying they are surprised by the lack of research conducted with young children and digital literacies, as there is a unique match between the two. They conclude with the fact that new literacy instruction is appropriate and necessary for young children, as it will define their futures. These are more statements to show the need for iPad research, especially with the primary grades.

Assessment

Even if teachers are using technology in their classrooms, they tend to use the same way of assessing digital work as they do traditional classroom work. This is because the best methods of assessing technology knowledge are yet to be determined (Karchmer-Klein & Shinas, 2012). Rubric categories still tend to focus on traditional notions of literacy mostly ignoring the full capabilities of technology. Karchmer-Klein & Shinas, (2012) say that students need to be encouraged to use the multimodality of technology. This will allow them to develop rich presentations that demonstrate their knowledge. This must be assessed with appropriate rubrics.

Integrating iPads

As new technologies emerge, teachers are challenged to match reading instruction to these new technologies (Larson, 2012). Electronic text, such as iPads, has many potential advantages including access to hundreds or thousands of eBooks, portability, cost efficiency, and more (Felvegi & Matthew, 2012). These new literacies are enhancing teaching and learning while also significantly changing the pedagogy of literacy instruction (Felvegi & Matthew, 2012). Tablets, more specifically iPads, are being sought in schools in order to integrate iPads with learning (Ensor, 2012). It is important to know how teachers are using iPads in their classrooms during instruction. This knowledge will aid future research to explore whether the iPad is simply a tool to enhance learning, or does it affect student achievement. According to Witte (2007), "It is difficult to evaluate a product by itself without looking at how instructors and students are using the technology" (p. 208). This leads to the importance of knowing how

teachers are using the iPad in order to evaluate the significance of the iPad on learning and achievement.

Applications are being designed daily. There are even apps for students to create apps. Rowsell, et al. (2013) says there is a tendency in literature to "romanticize technologies like iPads as a panacea, an answer to the challenge of 21st century literacy education" (p. 351). The hype of the iPad must be constrained as researchers focus on how the use of technology must be coupled with quality instruction so students go beyond pushing buttons and going through the motions of the apps in order for actual learning to take place (Northrop & Killeen, 2013).

Rowsell et al. (2013) found the power of learning was enhanced through the use of the iPad. The iPad had the power to promote student collaboration and participatory learning. While using apps such as the rhyming app *Bluster,* Rowsell and colleagues heard students openly discuss reading strategies. Other word level apps encouraged a natural sharing of metacognitive knowledge, which allowed struggling learners to listen to the thought processes of more proficient readers. This does not happen when children are independently completing worksheets. Even reluctant writers were able to contribute to collaborative writing, as they did not feel overwhelmed and pressured to write a whole story by themselves. Rowsell and colleagues also found that the teachers found themselves thinking about how they could incorporate iPads and apps into other subject areas. The use of iPads naturally spilled over into other subject areas in both skills and content. Further, their students were receptive and more engaged in all subject areas through the use of the iPad. This lends itself to the importance of research and how teachers can utilize iPads across the curriculum.

The following research questions guided this study:

1. Do kindergarten, 1st, and 2nd grade classroom teachers in a mid-western state use tablets/iPads in classroom instruction?
2. When do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
3. How do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
4. How do K-2 teachers in a mid-western state perceive the use of iPads for classroom instruction?

Summary

Schools today are adopting the iPad with little empirical evidence of its benefits. More research is needed, especially at the primary grades, to know how and when teachers are using it for instruction. This study is important, as no other data has been gathered for an entire state to see teachers' perceptions of iPad use in classroom instruction. This study is necessary to see how and when teachers are using this tool, for what types of instruction, and if they perceive the iPad as positively affecting both instruction and learning.

Chapter 3: METHODOLOGY

Introduction

The purpose of this study was to examine K-2 teachers' use of iPads during classroom instruction in one mid-western state. This goes beyond direct reading instruction to include reading in math, social studies, and science. From this study, the following hypothesis evolved. There appears to be a trend in classroom teachers' (K-2) use of tablet computers/iPads to instruct primary-grade students. The formal research questions follow:

1. Do kindergarten, 1st, and 2nd grade classroom teachers in a mid-western state use tablets/iPads in classroom instruction?
2. When do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
3. How do K-2 teachers in a mid-western state use tablets/iPads in classroom instruction?
4. How do K-2 teachers in a mid-western state perceive the use of iPads for classroom instruction?

Method

Surveys provide valuable, empirical data that can be collected from a large number of people at one time. According to Creswell (2012), survey research designs are "procedures in quantitative research in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population" (p. 376). Although surveys have been used in education since 1817, there are only two basic types: cross-sectional and longitudinal

(Creswell, 2012). This study is a cross-sectional study as it examines teachers' current perceptions and use of the iPad. For this study, a Qualtrics designed, web-based survey was sent to kindergarten, 1st, and 2nd grade teachers in a mid-western state (refer to Appendix A). Qualtrics (2014) was first released in 2005, but the current version has been in use since 2009. The list of schools was obtained from the State Department of Education. The list did not contain every teacher's email address, as the state does not require that information to be submitted. Therefore, the survey was sent to K-2 teachers whose email addresses are part of the Department of Education's database. Although administrators were not asked to complete a survey, for information purposes only, a cover letter was sent to the teachers' respective administrator.

The survey began by asking teachers if they used tablet computers in their classrooms. If they did not use tablets, the respondents were taken to the end of the survey. Several potential respondents emailed the researcher to say they did not open the survey because they do not have iPads at their school, and the survey title indicated the survey was about iPads in the classroom. If teachers used any type of tablet computer besides the iPad, they were prompted to complete the survey. Depending on the results, those that used iPads were compared to those that used other tablets. Anyone who answered yes to iPad use in the classroom began the survey. This descriptive study looked at responses from kindergarten, 1st, and 2nd grade teachers that use iPads in their classrooms for each item on the survey. To seek answers to the second research question, information was collected to identify when teachers use iPads in their classrooms. To answer the third research question, K-2 teachers were asked how they used iPads in their instruction. To answer the fourth research question, K-2 teachers were asked questions

related to their perceptions of iPad use. Refer to Appendix B to see the items that relate to each research question. Appendix C refers to demographic items, e.g. years of teaching experience, location of school, within the survey. The survey questions were purposefully reviewed by experts and revised to meet the purpose of the study.

Participants

A list of elementary schools that include kindergarten, 1st, and 2nd grades was obtained from a mid-western State's Department of Education. Then, a database of available K-2 teachers' email addresses and their respective elementary school administrators' email addresses was used to send out the electronic survey using the web-based survey instrument Qualtrics. A letter was sent to the aforementioned administrators informing them about the survey that was sent to their kindergarten, 1st, and 2nd grade teachers (refer to Appendix D); in hopes they would encourage the teachers to respond. Included on this cover letter was the option for administrators to receive survey results. An initial cover letter was sent to K-2 teachers at both private and public elementary schools (refer to Appendix E). Reminder letters after weeks one (refer to Appendix F) and two (refer to Appendix G) were also sent to the teachers. Participating teachers were given the option to view the results of the survey. A list of iPad resources, such as suggested educational apps and links to affordable professional development sessions, were provided to teachers upon the completion of the survey (refer to Appendix H).

Survey Development

The survey items were based on a previous qualitative study conducted by the researcher. The researcher used a questionnaire, classroom observations, and a focus group to investigate how three elementary teachers (two in 2nd, one in 3rd grades) at one school were using iPads in their classrooms. The classrooms were located in high socio-economic (SES) suburban school. Each teacher elected to use iPads in their classrooms from a shared school cart. The data were triangulated, and included questionnaire, classroom observations, and a focus group. From this study, the protocol for the current study was developed, with key issues identified by the teachers, which were incorporated into the survey.

In the present study, there are a variety of survey items that include both multiple choice and Likert scales. Some Likert scales include degree of agreement, whereas others ask for estimates. A short answer item was also included.

Qualtrics was used to organize and disseminate the survey. Electronic surveys are a quick and user-friendly option for busy teachers. The survey took approximately five minutes to complete. The hope was that ease of survey completion would net maximum results.

Procedures

Pilot Survey

A pilot study was conducted in a school of convenience where iPads are currently being utilized in K-2 classrooms. The school is a K-12 laboratory school located on a mid-western university campus. Participating teachers have experience that range from fewer than five years to more than 20 years of teaching experience. Revisions of the

survey were based on the responses of the teachers. Teachers who participated in the pilot study were eliminated from the sample of teachers used for the final survey.

Study Survey

All school administrators of K-2 classrooms in the mid-western state (private and public) received the same cover letter electronically explaining the purpose of the survey and the specific grade levels that were asked to participate (see Appendix B). Further, the K-2 teachers in those schools received a similar cover letter electronically, which explained the purpose of the exploratory study of K-2 teachers' iPad use in instruction, as well as instruction on how to complete and return the survey via Qualtrics (see Appendix C).

As teachers completed the survey and submitted it to Qualtrics, the results were compiled through a database at the University. Qualtrics supplied a code to each survey response to protect anonymity. Both administrators and teachers were given the option to receive survey results. Responding teachers also received a list of iPad resources (i.e. recommended apps and available free or low cost iPad training). Respondents that chose to receive survey results were prompted to enter their email address at the end of the survey. Requesting results will not compromise anonymity, as email addresses were collected separately from data collected via the survey instrument. The same holds true, as respondents were given the option to enter their contact information if they were willing to participate in future studies regarding iPad use in the classroom.

Time Frame

The teachers were given three weeks to complete the survey and return it to the researcher for data analysis. After one week, an email reminder was sent to participants

that had not completed the survey. Two weeks after the initial distribution, a final email was sent to non-participants to remind them of the purpose of the study and the upcoming due date (refer to Appendix D).

Analysis

Responses from participants were analyzed to address the research questions. The survey items were aligned with the research questions to show which survey item related to each research question.

Demographic questions were included at the end of the survey to gain background information from each participant and their school. Some of these questions included the teacher's years of teaching experience and grade level currently taught, as well as the school's free/reduced population.

Quantitative data (nominal and continuous) was collected from the survey items as well as one descriptive short answer. Descriptive statistical analysis was conducted to determine the standard deviations and means of the continuous variable. Also, frequency counts were conducted to analyze the nominal data. The Pearson r was used to determine correlations, most notably between the teachers' perceptions and classroom use of the iPad. This was done to test relationships between variables.

To add inter-rater reliability to the identification of the categories of the short response question, two researchers coded the responses. Each researcher coded the responses separately to determine perceived categories. Then, the researchers met to compare the identified categories and discuss any variance. Once more, the researchers examined the data independently to clarify the individual coding of the data. Finally, they met once more to align their coding. This indicated patterns and categories of other

ways teachers are using the iPad in classroom instruction (Goetz & LeCompte, 1984). Statistical relationships evolved from age, demographics, and usage; an example includes higher SES schools have more opportunities for iPad use. Appendix I aligns each item with a statistical procedure appropriate for analysis.

Chapter 4: RESULTS

Introduction

The purpose of this exploratory study was to examine K-2 teachers' use of iPads during classroom instruction in one mid-western state. The survey was designed to examine if, how, and when K-2 teachers use iPads in their classrooms. In addition, information was gathered on teacher perceptions to their use of iPads in the classroom. Demographic data was collected to illicit relationships between variables.

Results Addressing Classroom and Teacher Demographics

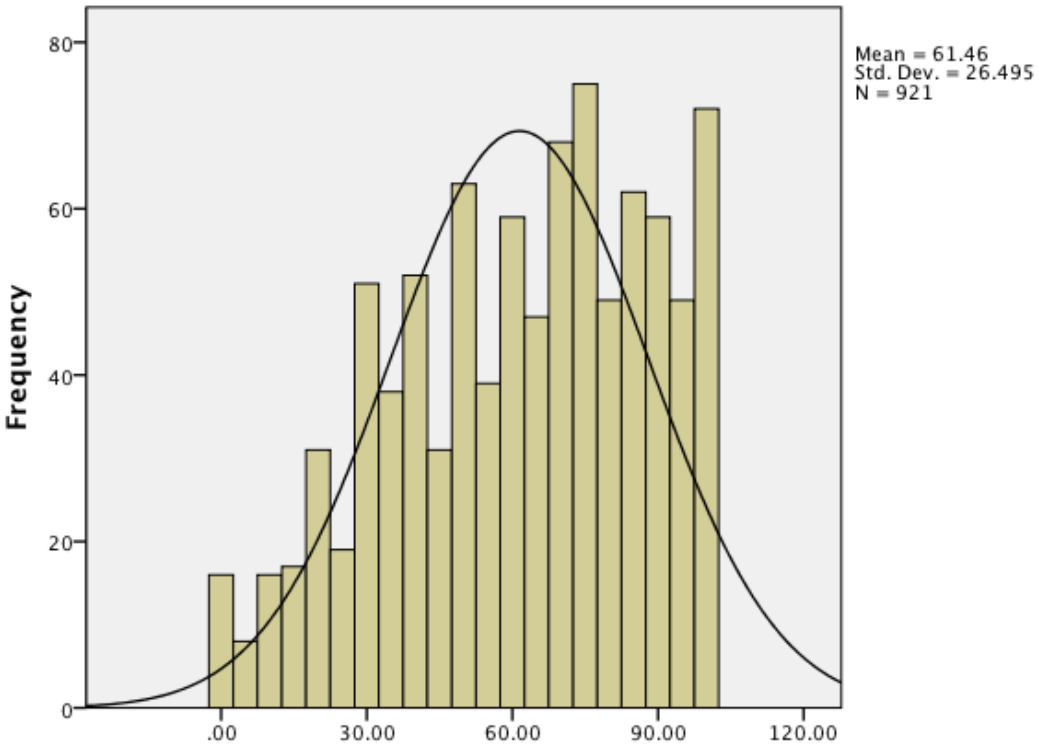
To understand the data, it is important to analyze the demographics of both the schools and the teacher respondents. Table 1 below corresponds to demographics. Respondents were K, 1, and 2 teachers at both public and private schools.

Table 1 *School demographics*

#	Answer		Response	%
1	Urban		126	29%
2	Rural		185	43%
3	Suburban		112	26%
4	Other		7	2%
	Total		430	100%

The majority of respondents came from rural schools, followed by urban and suburban. However, overall it was a fairly even distribution. The histogram below, labeled Figure 1, is the estimate of the respondents' schools free and reduced lunch population. This question was on a sliding scale, with "less than 25%" on the left hand side of the scale. The histogram follows a general bell curve, with the majority of free/reduced lunch being higher than 60%. Therefore, although rural districts were most represented, those districts were also high poverty schools.

Figure 1 *Estimate of the percentage of your schools' free/reduced lunch population*



Teacher demographics were examined as well. There was a fairly equal distribution of teachers between zero and 11 years of experience, with the majority of teachers having more than 11 years of experience. Table 2 shows the percentage of respondents' years of experience.

Table 2 *Years of teaching experience*

#	Answer		Response	%
1	0-3 years		138	11%
2	4-7 years		235	18%
3	8-11 years		176	13%
4	More than 11 years		763	58%
	Total		1,312	100%

The range of respondents' ages was also examined. This is shown in Table 3. There is a fairly equal distribution of age range of teachers.

Table 3 *Age ranges of teacher respondents*

#	Answer		Response	%
1	22-32 years old		294	22%
2	33-43 years old		375	29%
3	44-53 years old		347	27%
4	54 years or above		292	22%
	Total		1,308	100%

Looking at Table 4, there is a fairly equal distribution of grade levels. Those teaching anything besides K-2 were eliminated from previous tables. Only data from kindergarten, first, second; and combined K-2 respondents were considered for this survey. Other respondents' information may have been included in the short answer responses, but are not included in the statistical results.

Table 4 *Grade level taught by respondents*

#	Answer		Response	%
1	Kindergarten		358	27%
2	1st grade		271	21%
3	2nd grade		296	23%
4	Any other grade besides K, 1, or 2		58	4%
5	Combination of grades (please specify grades)		326	25%
	Total		1,309	100%

Results

Results Addressing Each Research Question

In order to examine the results of this study, survey items were aligned with its corresponding research question (see Appendix B). A description follows:

Research Question #1: Do kindergarten, 1st, and 2nd grade classroom teachers in a mid-western state use tablets/iPads in classroom instruction?

Based upon the data gathered from the three survey items related to research question #1, the majority of respondents use iPads in their classroom instruction. For the ease of reading this study, instead of "tablet/iPads", only "iPads" will be referenced, with the assumption that it refers to any type of tablet as well as iPads used in the classroom. This was followed by those that do not use iPads/tablets in their classroom, followed by a small percentage that utilizes another type of tablet (see Table 5).

Table 5 *Those K-2 respondents reported use of iPads, tablets, or neither*

Tablets used in teaching	*N*	Percentage
iPads	724	67%
Other tablets	26	2%
Do NOT use iPads or tablets	335	31%
TOTAL	1085	100%

Note: The survey was sent to all teachers in a mid-western state that teach K-2 students. This included fine arts teachers and special education teachers who are not included in any of the results.

Research question #1 asked of those teachers using iPads, how many iPads do they have access to for use in their classrooms. This number could be actual number of iPads in one's classroom, access to an iPad cart, or shared devices. Table 6 revealed most (74%) who responded have fewer than 10 tablets/iPads.

Table 6 *Number of tablets/iPads accessible in the classroom*

Range of tablets/iPads for use in classroom	*N*	Percentage
Fewer than 10 tablets/iPads	557	74%
11-20 tablets/iPads	57	8%
21-30 tablets/iPads	128	17%
More than 30 tablets/iPads	10	1%
TOTAL	753	100%

The third survey item related to research question #1 asked teachers how often (times/weekly) they used iPads in their classroom instruction. This question focused on instruction, not any other related task such as assessment and viewing of material via the iPad and ELMO or Smartboard. The highest percentage (39%) uses the devices 0-2 times per week. However, 35% use them 3-5 times per week. That is almost once daily. This was followed by 15% using them more than 10 times per week, with the fewest respondents (11%), using them 6-9 times per week. Table 7 displays these results.

Table 7 *Number of times per week tablet/iPad is used for classroom instruction*

Weekly use of tablets/iPads for classroom instruction.	*N*	Percentage
0-2 times per week	296	39%
3-5 times per week	260	35%
6-9 times per week	83	11%
More than 10 times per week	112	15%
TOTAL	751	100%

Based on the results, the majority of K-2 teachers who responded to the survey use iPads in classroom instruction. Although 69% use iPads in classroom instruction, 74% of those teachers have fewer than 10 iPads in their classrooms. Seventy-four percent use the devices 0-5 times per week, while 26% utilize them more than 6 times per week.

A short answer response was included in the survey (Table 8). The teachers were asked for comments about other uses of the iPad in the classroom, and iPad issues not addressed in the survey. The table lists all of the most frequent responses as coded by two researchers. One response could have multiple codes. For this study, only responses coded 10 or more times are considered frequent, thus included in the table. The most frequent response was that iPads were used for assessment. Another most frequent response was that teachers felt more iPads in their classrooms were needed.

Table 8 *Frequency of teachers' response (10+) to Item 16, "Comment on other ways you are using the iPad in your classroom, or other issues not addressed in the survey."*

Response topic	Total number of responses
iPads used for assessment	85
Limited number of iPads for classroom use	55
Used in workstation	40
Management/reward/motivate	32
Specific applications mentioned	23
Used to share/present	22
Lack of applications	19
Used to differentiate instruction	19
Lack of professional development	18
Used for tutoring/corrective learning	17
Use with special needs students	16
Research	15
Guided reading/small group use	15
Writing process	13

Note: Items 10 or less were not noted.

Research Question #1 Results Summary

Based upon the data provided by the respondents on the survey items pertaining to research question #1, most K-2 teachers (67%) use iPads in their classrooms. Only 2% of K-2 respondents use a non-Apple type of tablet, and 31% do not use any type of tablet device in their classroom. From the teachers' responses from the survey, it appears that teachers have access to only one iPad in their classroom and its main function is to gather assessment data.

Research Question #2: When do K-2 teachers use iPads in classroom instruction?

Three survey items related to research question #2. Two of the three items relate to whether iPads were used when teaching certain subject matter. For instance, K-2 teachers were asked if they use iPads during language arts, math, social studies, and/or

science. If respondents used iPads during language arts, they were then asked if iPads were used in phonics, word recognition, vocabulary, and comprehension. Frequency tables were conducted for each grade level individually, and then K-2 combined. The researcher examined the items by grade level first because certain skills, like phonics, are emphasized more in the early primary grades. Frequencies were also determined for K-2 combined for all three items. Although the primary grades are often aggregated, disaggregating by grade level offers a more detailed look at how teachers at each grade level are utilizing iPads. Refer to Table 9 for kindergarten use of iPads during language arts, math, social studies, and science. This does not add up to 100% as teachers could choose any subjects that relate to iPad usage.

Table 9 *Kindergarten teachers' use of tablets/iPads by subject matter*

Subject	*N*	Percentage
Language arts	226	55%
Math	174	42%
Social studies	31	8%
Science	41	10%

Kindergarten teachers mainly use iPads during language arts, followed by math, science, and social studies. Table 10 shows first grade teacher use of iPads by subject matter.

Table 10 *First grade teachers' use of tablets/iPads by subject matter*

Subject	*N*	Percentage
Language arts	150	46%
Math	130	39%
Social studies	28	9%
Science	47	14%

First grade teachers' use of iPads is similar to kindergarten teachers'. However, they use them slightly more for the content areas, and slightly less for language arts and math. Table 11 shows second grade teacher use of iPads by subject matter. Overall, these numbers indicate increased use of iPads in all subject matters in the second grade.

Table 11 *Second grade teachers' use of tablets/iPads by subject matter*

Subject	*N*	Percentage
Language arts	173	50%
Math	173	50%
Social studies	58	17%
Science	70	20%

Table 12 lists the percentage of use as combined of K-2 by subject matter. One thing to note for the content areas is all grade levels alone as well as combined use their iPads more for science than social studies.

Table 12 *K-2 teachers' use of tablets/iPads by subject matter*

Subject	*N*	Percentage
Language arts	549	51%
Math	477	44%
Social studies	117	11%
Science	158	15%

The second survey item relating to research question #2 examines specific aspects of language arts instruction. The respondents' use of iPads during instruction in phonics, word recognition, vocabulary, and comprehension were all explored. The following tables show this item by individual grade level, then by K-2 combined. Table 13 addresses each subcategory for language arts for kindergarten only.

Table 13 *Kindergarten teachers' use of tablets/iPads by language arts subcategories*

Subcategories	*N*	Percentage
Phonics	211	51%
Word recognition	188	46%
Vocabulary	93	23%
Comprehension	89	22%

Ninety-seven percent of kindergarten teachers use the iPad for phonics and word recognition instruction. See Table 14 for frequencies on first grade and language arts subcategories.

Table 14 *First grade teachers' use of tablets/iPads by language arts subcategories*

Subcategories	*N*	Percentage
Phonics	131	40%
Word recognition	114	35%
Vocabulary	81	25%
Comprehension	87	26%

As students move on to first grade, there is less emphasis on phonics and word recognition, and more iPad time spent on vocabulary and comprehension. Next, Table 15 describes second grade and language arts subcategories.

Table 15 *Second grade teachers' use of tablets/iPads by language arts subcategories*

Subcategories	*N*	Percentage
Phonics	128	37%
Word recognition	102	30%
Vocabulary	95	28%
Comprehension	114	33%

The trend continues in second grade, as there is less emphasis on phonics and word recognition and more on vocabulary and comprehension, which supports the states' academic standards. The overall use of iPads in the language arts subcategories reveals

that there is more emphasis on phonics and word recognition in the early primary grades and more in vocabulary and comprehension in the later primary grades. Finally, Table 16 shows the K-2 combined percentages.

Table 16 *K-2 combined teachers' use of tablets/iPads by language arts subcategories*

Subcategories	*N*	Percentage
Phonics	470	43%
Word recognition	404	37%
Vocabulary	269	25%
Comprehension	290	27%

The final survey item related to research question #2 was regarding teachers sharing apps used in the classroom with parents. By doing this, teachers are able to encourage additional practice at home, while parents can see what skills are being taught and reinforced at school. There was minimal difference between K, 1, and 2. Therefore, K-2 combined, 28% (N=306) of K-2 teachers are sharing apps with parents, whereas 72% (*N*=781) are not.

Research Question #2 Results Summary

K-2 teachers in this study are using iPads in the core subjects of language arts and math. As students get older, iPads have an increased use with science and social studies, but still are most often used in language arts. The subcategories of language arts, phonics and word recognition are addressed most often in kindergarten and first grade, and more time is spent on iPads with vocabulary and comprehension when students reach second grade. Most teachers did not say they shared apps they used in the classroom with parents.

Research Question #3: How do K-2 teachers use iPads in classroom instruction?

Research question #3 examines more specifically how many minutes per week

teachers are using iPads in content area instruction. Table 17 describes the amount of time per week that K, 1, and 2 teachers are using iPads in content area instruction.

Table 17 *How many minutes per week iPads are used in social studies and science instruction*

Grade Level	Average (mean) minutes per week iPads used in social studies instruction	Average (mean) minutes per week iPads used in science instruction
Kindergarten	16	17
First grade	12	14
Second grade	20	20
K-2 combined	18	18

Results from the items relating to content area reading in research question #2 found that teachers use iPads in both science and social studies. When asked about the average minutes iPads are used for content area reading, slightly more teachers indicated that they use them for science than social studies instruction in kindergarten and first grade. However, second grade uses them for approximately 20 minutes per week for both social studies and science, so the averages are the same. When looking at K-2 combined use of iPads during content area instruction, the average was 18 minutes per week: the same for both science and social studies. When given the opportunity for teachers to comment on other ways the iPad is used in classrooms, or issues not addressed in the survey, there were no comments relating to content area instruction.

Respondents' statements included many comments regarding iPad use with research as well as inquiry learning. A Likert scale was used for teachers to respond to whether iPads were used for inquiry learning. Table 18 shows by grade level, and K-2 combined if teachers are using the iPad for inquiry learning.

Table 18 *Are teachers using iPads for inquiry learning?*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	15%	33%	46%	6%
First grade	23%	33%	38%	6%
Second grade	19%	24%	48%	9%
K-2 combined	19%	30%	44%	7%

Examining whether teachers agree or disagree about using iPads for inquiry learning, more teachers use it. However, slightly less than 50% for individual as well as combined grade levels use it for such.

Respondent comments regarding classroom management focused on the app Class Dojo. Item 12_5 addressed the use of iPads and classroom management. A Likert scale was also used for the classroom management question. Results can be seen below in Table 19. The results reveal the iPad is used for classroom management depending on the teacher.

Table 19 *Do teachers use tablets/iPads for classroom management?*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	20%	36%	38%	6%
First grade	22%	34%	39%	5%
Second grade	18%	35%	36%	11%
K-2 combined	20%	35%	38%	7%

Differentiation was also explored. Many teachers simply stated they use iPads to differentiate instruction. Table 20 includes survey results for iPad use and differentiation.

Table 20 *Teachers use tablets/iPads for differentiation.*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	4%	8%	60%	28%
First grade	9%	10%	57%	24%
Second grade	10%	11%	58%	22%
K-2 combined	8%	9%	58%	25%

This table shows a strong tendency for teachers to use the iPads to differentiate their instruction based on student need. Across grade levels, the minimum of eighty-one percent of teachers agrees or strongly agrees they use iPads for differentiated instruction.

Just over half of respondents indicated they collaborate with their colleagues through the use of the iPad (see Table 21). There were not any comments about professional collaboration, so this could include sharing apps such as on Evernote, data sharing on students, or the ability to email colleagues via the iPad.

Table 21 *Do teachers use tablets/iPads for peer collaboration?*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	14%	32%	41%	13%
First grade	16%	33%	36%	15%
Second grade	17%	30%	42%	11%
K-2 combined	15%	32%	40%	13%

Item 13 inquired about how teachers group students in regard to iPad use. See Table 22. The specific item stated, "Regardless of whether each student has his or her own iPad, my students use their iPads (check all that apply)."

Table 22 *K-2 combined grouping of students in tablet/iPad use*

Grouping	*N*	Percentage
Individually	564	52%
2-6 students	434	40%
7 or more students	91	8%
None of the above	101	9%

Most students use iPads individually followed by small groups of students. This statistic can be confirmed by comments that most teachers use iPads in learning workstations or for differentiation. This also aligns with comments that more iPads are desired in classrooms.

The final item relating to research question #3 is whether teachers use the iPad to communicate with parents. Class Dojo is one way that teachers have said they communicate behavior to parents. For K-2 combined, 15% of teachers communicate with parents via iPad, whereas 85% said they do not.

Research Question #3 Results Summary

K-2 teachers tend not to use the iPad for content area instruction. Just over half of K-2 teachers use the iPad for inquiry learning. Many teachers commented on this. The majority of the teachers are not using iPads for classroom management, but do use it for differentiation. Teachers collaborate with each other via the iPad, and have students use it individually or in small groups. From this study, it appears teachers in this study are using iPads in a variety of ways.

Research Question #4: How do K-2 teachers in a mid-western state perceive the use of iPads for classroom instruction?

Results from this survey show that among K-2 teachers, 25% chose to include iPads into their classrooms. Some respondent comments were they received iPads

through grants; other respondents indicated they were using their own device. Twenty-eight percent of respondents indicated that iPads were mandated. Eleven percent signified that administrators did not include them in the decision to use iPads in their classrooms. Another 11% responded to "none of the above" on this question.

Often times technology is brought into the classroom without proper training for teachers on how to use it best with their students (Karchmer-Klein & Shinas, 2012). Administrators introduce teachers to what is popular, in this case iPads, without the needed professional development to go with it. Item 4 asked respondents if they had attended professional development sessions for iPad use in their classroom. Fifty-seven percent of the teachers responded had attended professional development on iPad use, while 43% had not. If respondents had attended professional development, they received a follow-up question to examine whether it adequately prepared them to use it (iPads) in the classroom. K-2 combined responses were similar to individual grade levels: 70% agreed or strongly agreed that iPad professional development prepared them to use iPads in the classroom, whereas 30% disagreed. Not considering professional development, K-2 teachers were asked if they feel confident using an iPad in classroom instruction, and 75% agreed or strongly agreed while 25% disagreed or strongly disagreed.

Along with feeling confident using the iPad in classroom instruction, most K-2 teachers also felt comfortable supervising students' iPad use. The results of the survey indicated hesitancy allowing students access to technology that has the ability to connect to the Internet. Of K-2 teachers combined, 34% agree or strongly agree that it is difficult to supervise student iPad use, whereas 66% disagree or strongly disagree.

In this study, K-2 respondents said that 7% of parents suggest apps that may be useful in the classroom; and 8% feel the iPad has strengthened the home/school connection. Currently, 84% of K-2 teachers agree or strongly agree that their students are aware of the workings of an iPad, whereas 16% do not.

Refer to Table 23, which reveals more teachers agree they learn things from students as the grade level increases. It appears in this study as children get older, they are more likely to make suggestions to their teachers about use of iPads.

Table 23 *My students teach me things about tablets/iPads*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	11%	52%	33%	4%
First grade	11%	42%	41%	6%
Second grade	13%	30%	44%	13%

As students get older, they are also more apt to suggest appropriate educational apps to teachers. See Table 24 for these results.

Table 24 *Students suggest educational apps*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	15%	66%	18%	1%
First grade	17%	53%	28%	3%
Second grade	16%	42%	35%	7%

The responses to student motivation and iPads were generally the same for split grade level. Ninety-three percent of K-2 teachers combined agree that the iPad is motivating versus 7% that disagree. Student engagement is different than motivation. One Likert survey item asked if students are engaged (focused and interested) when using the iPad. This went beyond students using the iPad as a reward, but instead when used for learning, students were both focused and interested. Although it was technically

asking something different, the results for engagement netted the same as motivation: 93% agree and 7% disagree.

The next survey item addressed if the iPad was distracting. Kindergarten teachers perceive the iPad to be less distracting than 1st grade teachers, followed by 2nd grade. See Table 25.

Table 25 *Students are distracted by the iPad*

	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	18%	62%	18%	2%
First grade	18%	59%	22%	1%
Second grade	16%	42%	35%	7%

Table 26 describes teacher perceptions (by grade level and combined) on whether the iPad helps students learn. Across the three grades, only 10% of K-2 teachers do not think the iPad helps their students learn. Ninety percent of them either agree or strongly agree that the iPad helps students learn.

Table 26 *The iPad helps students learn*

Grade level	Strongly disagree	Disagree	Agree	Strongly Agree
Kindergarten	3%	6%	70%	21%
First grade	6%	5%	71%	18%
Second grade	5%	6%	67%	22%
K-2 combined	4%	6%	69%	21%

Research Question #4 Results Summary

Research question #4 revealed that K-2 teachers have various perceptions about iPad use in classroom instruction. Twenty-five percent of teachers in this study chose to

implement iPads in their classroom, while the same percentage was told to do it by administration. Teachers who had iPad professional development generally felt adequately prepared to use the iPad in the classroom. As students get older, it becomes more difficult for teachers to supervise student iPad use. There is potential for growth in using the iPad to strengthen the home/school connection. Upper primary students suggest apps and teach their teachers about iPads, yet all seem to be knowledgeable about iPads. Teachers perceive the iPad as both motivating and engaging, with some sort of distraction as well. Administrators provide many K-2 teachers with one iPad for the use of data collection only. Kindergarten, 1st, and 2nd grade teachers combined covet more iPads in their classrooms; especially with 90% of respondents believing the iPad helps their students learn.

Correlations

Respondents were asked to indicate whether any of the following applied to them: use social media weekly, enjoy playing video games, use a smartphone, enjoy playing games on the computer and/or iPad, and/or use of the iPad outside of the classroom. A weak correlation was found (r=.21) between media use outside of the classroom and confidence using devices in the classroom.

Teacher age and years of experience was also examined for a relationship. Pearson's r of -.13 indicates a very weak significance between the two. A relationship between years of teaching experience and confidence using the iPad in classroom instruction was also examined. Another weak but significant correlation was found r=-.11. The results of this study indicate weak significant differences in teachers' confidence of iPad use in the classroom and age of teacher, as well as confidence of iPad

use in the classroom and years of teaching experience of the teacher. In other words, this study indicates that neither teacher age nor years of teaching experience relate to confidence using an iPad in classroom instruction.

Another correlation examined was whether poorer students are disadvantaged due to lack of new literacies at school (Forzani & Leu, 2012), or were iPads used more at wealthier, suburban or rural schools, versus those at urban schools. The Chi Square Test of Independence was conducted to examine this categorical data and the researcher examined whether there was a relationship between iPad use and location of the school. The results of the test was significant ($p < .001$) when examining iPad usage in urban schools versus those at rural and suburban schools. Urban schools use iPads less than rural or suburban schools.

One other significant correlation was found in this study. Pearson's *r* of .538 indicates a moderate correlation between teacher confidence in the use of iPads in the classroom and whether they received adequate professional development. If teachers feel they received adequate professional development on iPad use, they were more likely to feel confident using the device in their classroom.

Summary

While the majority (68%) of K-2 teachers in one mid-western state have access to iPads, 81% have fewer than 10 iPads available for classroom use. It was frequently stated that many teachers have only one iPad that has been designated for data collection. Eighty-one percent of teachers use iPads, but over all use them fewer than five times per week.

Teachers are using iPads mainly in language arts instruction followed by math, science and social studies. Vocabulary, comprehension, phonics and word recognition are being taught with iPads in all of K-2, but more time is spent on each depending on the grade level. At this time, only 28% of K-2 teachers share apps with parents. In addition, K-2 teachers tend not to use the iPad for content area instruction, yet if they do, generally it is used in science education. Just over half of K-2 teachers use the iPad for inquiry learning. The majority of the teachers are not using iPads for classroom management, but do use it for differentiation. Some teachers collaborate with each other via the iPad, and have students use it individually or in small groups.

Overall, about 25% of teachers chose to implement iPads in their classroom, while about the same percentage were told to do it by administration. Teachers that have had iPad professional development generally feel adequately prepared to use the iPad in the classroom. As students get older, it becomes more difficult for teachers to supervise student iPad use. There is room for growth in using the iPad to strengthen the home/school connection. Older students tend to recommend apps to teachers, yet all students seem to be knowledgeable about iPads. Teachers perceive the iPad as both motivating and engaging, but they find it can be a distraction. Administrators provide many K-2 teachers with one iPad for the use of data collection only. K-2 teachers wish for more iPads in their classrooms, especially with 90% of respondents believing the iPad helps their students learn.

This descriptive study found weak correlations between teacher use of technology outside of the classroom and their confidence using it in the classroom. Teacher age and years of teaching experience indicated a weak correlation using iPads in the classroom.

However, teachers that had received adequate professional development feel more confident using iPads in the classroom. Urban schools have access to fewer iPads than do rural or suburban schools.

Chapter 5: DISCUSSION

Introduction

The purpose of this exploratory study was to examine primary teachers' use of iPads during classroom instruction in one mid-western state. Three different areas were examined: (a) if K-2 teachers were using iPads in classroom instruction; (b) how they were using them; and (c) when K-2 teachers were using iPads in their classrooms. Additional information was gathered in regard to teachers' perceptions to the use of iPads in the classroom. Finally, demographic data were gathered to understand relationships between variables. Below is a discussion of the results.

First, the study revealed teachers in this mid-western state are exploring the use of iPads in various ways. This is reported below with a discussion of each topic. In addition, teachers have concerns and issues with the use of iPads.

iPads are Used for Language Arts Instruction and Literacy Workstations

Kindergarten teachers mainly use iPads during language arts, followed by math, science, and social studies. This makes logical sense based on kindergarten standards. The emphasis is on phonics and learning sight words, followed by vocabulary and comprehension instruction. One respondent commented, "I only use a few apps, but find these to be very effective. With kindergarten students, I use the Word Wizard app to have students sound out words and check spelling on their own." This response from an apparent kindergarten teacher fits with the high survey response rate of kindergarten

teachers using iPad to teach phonics and word recognition. It also alludes to making kindergarteners independent and responsible for their work by spell checking on their own. This is yet another way that teachers are using iPads innovatively. The iPad is allowing more independence at the primary grades thus freeing teachers for other tasks beyond the simplistic such as checking spelling. This relates to Pressey's original use of the teaching machine (McDonald et al., 2005) to allow the machine to do mundane tasks while allowing the teacher more time for teaching.

Survey results found first grade teachers' use of iPads similar to kindergarten teachers. As students move on to first grade, there is less emphasis on phonics and word recognition, and more iPad time is spent on vocabulary and comprehension. Again, this is logical with a slightly older student with different, more advanced standards. The teachers use iPads slightly more with the content areas, and slightly less for language arts and math. The trend continues in second grade, as there is less emphasis on phonics and word recognition and more on vocabulary and comprehension. By now many students have mastered phonics, and are moving on to more challenging content.

The use of workstations was also common. Many of the teachers in this study had limited access to iPads. It may be a way to utilize few iPads with more students. This allows individual iPad use as classroom students rotate among workstations. Individual respondents support this conclusion such as "I have two iPads purchased with grant money. I only use them during literacy work stations," and "The primary use (of iPads) is at stations during the literacy block," and "I use them during my balanced literacy groups as a center." It would seem that a greater number of iPads in the classroom would promote greater use of the iPad as more students would have access to iPads at the same

time.

What is still not known is whether classrooms have access to individual iPads or if students are using iPads individually in workstations or in a 2:1 pattern (two students for every iPad). How teachers choose to group would be interesting to explore, especially in regard to learning across curriculum. For example, it would be beneficial to know if partner work on iPads during science instruction is more beneficial to students as it allows for collaboration in a traditional mode of inquiry learning that science seems to foster. Roswell's research (2013) regarding the social aspect to learning supports this type of collaboration.

iPads Are Used to Differentiate Instruction

Another way primary teachers in this study are using iPads is for differentiation to address specific students' learning levels. One teacher with a high ability student stated, "I have just bought apps for a kindergartener working at a fifth grade level." This allows the teacher to meet the needs of a kindergarten student academically at a 5th grade level while still providing the developmentally appropriate social situations for a kindergarten student (Askins, 2010). Another teacher commented, "The individual skill practice with apps, information resources and leveled books are the best thing I have found for young students." This allows teachers to meet their students' varying academic needs. With one-on-one iPad use, students can be reading books at different levels and working on other assignments at their own levels. Apps offer differentiation as well. For example, Spelling City (SpellingCity.com) allows teachers to devise their own spelling lists for individual students or classrooms. Students can all be working on a spelling assignment via Spelling City, but have different lists of skills or words being studied. This is a strong

benefit for iPads as it helps learners who struggle as well as the students who are high ability. By tailoring lessons to meet individual student needs, students receive appropriate instruction and practice and therefore may stay on task, which in turn positively affects both behavior and learning (Ensor, 2012). The ability to differentiate makes a strong case for iPads.

Primary Teachers Learn About iPads from Their Students

Respondents from this survey reported their students are aware of how iPads work. Many parents have iPhones or smartphones to which their children have been exposed. These devices are similar to iPads, especially with the aspect of touch technology. This is a trend that will probably continue as smartphones decrease in price and more people are choosing to own them (Harjani, 2013). By coming to school already aware of how an iPad works, less time is spent teaching students how to use the technology with more time devoted to using the device for learning.

Teachers often commented that they learn about technology from their students (Harmon, 2012). One respondent in this study referred to 4th grade book buddies that come to read with kindergarten students, "Sometimes the 4th grade students show me things I didn't know regarding the iPads." The respondent was referring to an older student, not a K-2 student, so it is interesting to note how teacher responses change based on the grade level they teach. Results from this survey found that fewer kindergarten teachers learn from their students compared to first and second grade students. The same is true for student suggested apps. As students get older, they are more apt to suggest appropriate educational apps to teachers. Future studies could examine when this apparent trend diminishes because of maturity of a child.

iPads Are Used To Motivate and Engage Students

Respondents in this study found the iPad to be motivating and engaging to their students. Motivation is a reason for implementing technology into the classroom. However, past research has shown differing views on technology and motivation, illustrating teachers motivate, not technology (Peck & Dorricott, 1994). At this time, it appears that no longitudinal studies have been conducted on iPads and motivation. One teacher was concerned that children were sometimes were not giving their best effort on assigned work. "I find that sometimes students rush through their work so that they can get on an iPad." Although many respondents said they use the iPad for rewards. This was often mentioned with special needs students, as it is motivating to use the iPad to help the students stay on task, "I have a student with autism who sometimes struggles to complete standardized assessments and offering the iPad as a reward works wonders."

Teachers Perceive the iPad Helps Their Students Learn

One of the most important things to learn from this survey is whether the iPad is simply a device, or do teachers perceive the iPad as a way to help students learn. It appears from this study that teachers feel the iPad is a strong tool for learning in the primary grades. This is a key finding as this device is costly for schools to adopt for all students. Research such as this will help administrators make decisions regarding the implementation of iPad adoptions. Since this was an exploratory study, more research needs to be conducted to examine how and why teachers believe the iPad helps students learn. Falloon (2013) found iPad apps that mimic good teaching were the most effective

to aid in student learning. As schools consider iPads as part of their curriculum, more research needs to be conducted to examine specifically how the iPad impacts learning.

Teachers Want More iPads for Student Use

The study found that it did not matter whether the teacher or administrator brought iPads into the classroom, they wanted more devices for instruction. "I only have my personal iPad and iPhone. I let the students take turns on each device. I teach kindergarten and wish so much that I could have about 10 tablets in my room. So many wonderful apps for little ones." The comments from teachers focused on how iPads could benefit their students. "I wish I had more iPads for the students to use. There are so many possibilities of things we could do and ways the students could benefit, it we had iPads for the students to use." This same respondent said budget issues in the district were a concern so there is not funding available to purchase iPads for students or classrooms. Many commented that 1:1 would be ideal. "Wish I had an iPad for each student!!"

Administrators View the iPad as an Assessment Tool

Teachers perceive administrators have a different purpose for iPads. Administrators tend to be more data-driven, thus a focus on using iPads for assessment purposes. This was a major pattern in the open-ended response data. One such comment was, "There is only one iPad in the class and it is the teacher's. It is primarily used for assessment purposes as dictated by the district." Teacher responses focused on mandated use of the iPad for progress monitoring and data collection. Frustration was indicated that the device was for teachers use only and not for students. Several teachers stated that they were not allowed to download apps for student use, and that the iPad was strictly to

be used for mCLASS (a 3D program to measure reading skill development in K-5 students) and DIBELS (Dynamic Indicators of Basic Early Literacy Skills) data. "I am pretty disappointed that we only are allowed to use the iPads we have for testing. We cannot get apps, or use them for students." Other teachers commented on restrictions placed on them in regard to the use of the iPad. "I have only one iPad in my classroom that is designated for assessing students' reading and math progress." Again, limits are put on what teachers are allowed to do with the iPad. This finding was unanticipated with so many comments focusing on the single use of the iPad for data collection. Teachers view the iPad as having so much potential to help students learn and indicated frustration when the technology was used in such as simplistic way. Teachers know they are expected to use technology in their instruction (Larson, 2012), yet administrators have their own purpose for the technology (McDonald et al, 2005).

Teachers Need Professional Development They View Worthwhile

This survey found that 57% of teachers that have iPads in their classrooms have attended professional development on the use of iPads in their classrooms, while 43% had not. Of the 57% that attended, 70% felt that it prepared them to use the iPad in the classroom, while 30% viewed the professional development as inadequate. Considering the 30% who felt their professional learning was inadequate, along with the 43% that had not attended any professional development seemed to have led to some frustrated educators, according to their comments. "It would be nice to bring a presenter to my school to show us good apps to use and other tidbits of management," and "My frustration with the first year (of implementation) was in trying to get students to use apps presented to us as a staff by tech people that never taught small children." Lastly, one

respondent stated, "iPads were given to teachers without adequate professional development. We just were told to 'play around' with them. Hopefully we will be given inservice next year?" Teachers need professional learning that they deem adequate to prepare them to use iPads in their classrooms. This professional development needs to be presented by trainers knowledgeable about how children learn in order to present appropriate material for teachers to use in their classrooms. Although this survey found that teachers overall feel confident using the device, those that had participated in professional learning felt more prepared to use the device in their classrooms.

Teachers need to have self-efficacy in regard to technology in order to integrate it into their practice (Kim C., Kim, M., Lee, C., Spector, J. M., & DeMeester, K., 2013). Thus, it is important to have confidence using the iPad in order to change practice by integrating it into the classroom.

A Digital Divide was Revealed Across Schools

Between urban schools and rural/suburban schools there was variance to the accessibility of iPads in the classroom. There is still a digital divide (Wohlwend, 2010). Although poverty was found at rural schools, those schools still offered iPads more often than urban schools. Therefore, according to this study, lack of technology has more to do with location of school rather than socioeconomic status. There is a need to find equity is this area. Funding needs to become available to allow the same resources at urban schools that are found at rural and suburban schools. Again, this study took place in one mid-western state. Results may be different in other areas of the country. More research needs to be done on this relevant issue.

Limitations

There were several limitations to this study. One limitation is that participants came from just one mid-western state. Due to the response rate of 16%, generalizations cannot be made. Secondly, the assumption was the state would supply the researcher with a complete list of K-2 schools with related teachers and administrators. Although the State Department of Education website has a map that includes schools using iPads, the data is self-reported, thus not all schools are represented. This map represents only schools with 1:1 iPad initiatives. This excludes schools that may have 2:1 iPads, iPad carts, partial iPad sets purchased through grants, teachers that have only one iPad mandated for assessment, etc. Therefore, in order to be more thorough, the researcher requested a full list of all K-2 teachers and their administrators. This list included all teachers of K-2 students, which included resource and fine arts teachers that had to be parsed out. Lastly, surveys in general have limitations. Questionnaires are optional, and the majority of people who receive them do not complete them (Leedy & Ormrod, 2013). Those that do return them do not necessarily represent the intended sample. This survey did not ask for the general geographic location of the participant (i.e. north, central, or southern section of the state) so statements regarding locations within the state cannot be made. The participants' responses will represent their literary skills, and they may misinterpret one or more of the questions.

Another limitation to this study was the title of the survey, which was "iPad survey." When an email reminder went out to those that had not completed the survey, the researcher received several responses from teachers that stated they had not completed the survey because iPads were not used in their classroom or school. In fact, if

respondents did not have iPads in their classroom, they simply needed to answer no and complete the demographic questions to complete this survey. It is possible that more non-respondents do not have iPads, which may have netted different results in this survey. This may have limited the response rate, which in turn could have skewed the results.

Implications

For Educators and Administrators

Educators and administrators must be aware that iPads are in schools and are continuing to be adopted into classrooms. Teachers covet the devices as they feel they benefit students and help them learn. Administrators are responsible for researching technology (McDonald et al., 2005) before they bring it into the classroom to make sure it is fiscally responsible and offers benefits for students. They are also responsible for arranging and providing funding for professional learning for teachers so they know how to use the device to the best of their ability.

Teachers need to stay educated on the best way to use the devices to benefit their students and their students' families. Educators need to look beyond the iPad as a tool and focus on the use and benefits of iPads for student learning (Long, 2014). They need to look at the untapped potential iPads could offer such as outreach to families and to provide the best learning opportunities for their students. New or improved teaching practices may evolve as teachers find the devices useful for inquiry learning, differentiation, and classroom management. Studies such as this one will provide empirical information to aid administrators in making the best decisions for their teachers, students, and schools.

For Policy Makers

Policy makers need to stay abreast of the frequent changes in technology, such as iPads and education. Online skills need to be part of the curriculum, most notably for students' online reading comprehension and inquiry learning. These skills need to be assessed as skills that are assessed on standardized tests are taught in the classroom (Coiro, 2007). Common Core and the Online Reading Comprehension Assessment (ORCA) are aligned (Coiro & Kennedy, 2011). For example, if students are assessed on standardized tests for their ability to decipher credible information presented online, that skill will be taught in the classroom. This is an important skill to have as citing textual evidence is part of Common Core and that evidence must be credible (Lapp, Thayre, Wolsey, & Fisher, 2014). Policy needs to be made regarding the use of iPads, to include all schools regardless of school location and SES. Students need access to technology no matter where their school is located. Policy should include funding for professional learning opportunities as this study found teachers that perceive their professional development to be adequate are more likely to feel confident using the iPad in their classroom. This goes beyond providing money to simply purchase technology, but instead to provide training on how to use it to positively impact student learning. Stand alone funding for technology is not the issue; however, funding for how to use the technology is key (Long, 2014)

Further Research

More research needs to be done to find out the most effective ways to use iPads in classroom instruction. With regard to the research questions, more research needs to be done to examine the number of iPads in classrooms to see if teachers are using it solely

for assessment and data gathering, or if iPads are in students' hands for learning. Currently there is no research available to know if iPads are most beneficial for students to use individually, or if collaborating in groups is best. It would be helpful to examine the potential iPads have, especially in building home/school collaboration, even beyond sharing apps between parents and teachers. The iPad has the potential to change the way teachers teach, for example, the respondent that now has her kindergarten students check their own work. Some teachers have utilized the flipped classroom, with students using their iPads to access content at home via videos and online lessons, with class time being used to work through problems and collaborate (Tucker, 2012). Continuing research needs to take place to know how children are using iPads in education, what thinking process they use, and how teaching practices evolve to best utilize these devices for student learning.

Findings from this study indicate K-2 teachers are mainly using iPads in language arts and math instruction. Further studies need to be done to investigate the use of iPads in the content areas. Teachers are using iPads for inquiry learning, but it would be helpful to see how teachers are using them for research and other aspects of inquiry learning, especially as it relates to the content areas and differentiation. Although in its infancy, one study has shown that students learn from the iPad by presenting difficult scientific material, such as conceptualizing astronomical scale, in a different way than in traditional textbook drawings (Schneps, Ruel, Sonnert, Dussault, Griffin, & Sadler, 2014). More research is needed to see if teacher perceptions are correct, that indeed iPads help students learn. Classroom management and iPads go beyond the popular app Class Dojo, and research needs to be done on the potential of its use in managing

behavior. As motivated and engaged students tend to have fewer negative behaviors, more research needs to be done on how to keep the technology engaging without distracting students. Teachers need to know how to evaluate apps to know the best ones to choose for their students. At the time of this study, only one study had been published stating that apps that mimic good teaching help student learn (Falloon, 2013).

Conclusions

This study found that teachers in one mid-western state are utilizing iPads in many ways. This was an exploratory study as little research has been done on iPad use in K-2 classrooms. This study indicates that K-2 teachers have iPads in their classrooms and want to use them with their students as they feel it helps them learn. At this time it appears that the iPad is an educational trend that teachers in this study support. The iPad is a new era of technology in the classroom. This study has scratched the surface of potential research in the area of iPads and education. Since the days of the teaching machine (Lumsdaine, 1965), technology in the classroom has changed and evolved, and the iPad will probably be replaced by something else in the future. However, never in the history of civilization has a new technology been adopted by so many in such a short period of time (Leu, 2011). The iPad may go away from the classroom, but technology in the classroom is here to stay. Technology is part of the future, and teachers are responsible for preparing their students for the future (International Reading Association, 2009), and often times for jobs not yet created. At this time it is iPads, and Hutchison and Reinking (2011) state that it is "imperative to examine how the tool (iPads) can help teachers meet curricular goals to engage in what has been termed curricular integration as opposed to technological integration" (p. 312). In the end, teachers realize it is not

technology that transforms education. One teacher from Waverly Shell Rock Middle Schools said it best. "The iPad won't transform education, I have to, it's still up to the teacher" (Abeling, 2012).

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APPENDIX A

Qualtrics Web-Based Survey

Please see the attached link below to access the online survey via Qualtrics.
https://bsu.qualtrics.com/ControlPanel/Ajax.php?action=GetSu

Consent Block

Classroom iPad Use Survey

Welcome to the iPad use survey, the following is a consent form outlining our responsibilities to you as a respondent.

Consent Form

Changing course: Mid-western primary-grade teachers' perception and use of iPads for classroom instruction.

Please read the following brief description of this important study, and then indicate if you agree to participate by clicking "I agree to participate" below.

Study Title
Changing course: Mid-western primary-grade teachers' perception and use of iPads for classroom instruction.

Study Purpose and Rationale
The purpose of the study is to examine teachers' perceptions and use of iPads in their classrooms. More schools are adopting iPads, yet little research has been done in regard to the iPad , especially in the primary grades.

Inclusion/Exclusion Criteria
K-2 teachers in a mid-western state will receive the surveys. Administrators will be notified via email that K-2 teachers in their building will receive the survey. Participants will range in age from 22-70.

Participation Procedure and Duration
Administrators will receive an email informing them that their K-2 teachers will receive a survey regarding iPads in classroom instruction. K-2 teachers will be invited to participate in brief survey that should take no longer than 5 minutes to complete. Administrators and participating teachers may choose to receive a copy of the survey results. Upon completion of the survey, participating teachers will receive a list of iPad resources, such as suggested educational apps and links to professional development.

Data Confidentiality or Anonymity
All survey data results will be anonymous.

Storage of Data
All information that identifies specific schools and survey data will be kept in a locked office. The data will be kept for one year. The researcher will have access to the data.

Benefits
Administrators and K-2 teachers may use the survey results in future decision-making regarding iPad use and education. Also, participating teachers will receive a list of iPad resources.

Risks
There are no potential risks.

Voluntary Participation
Your participation in this study is completely voluntary, and you are free to withdraw your permission at any time for any reason without penalty or prejudice from the researcher.

IRB Contact Information
For questions about your rights as a research subject, please contact Director, Office of Research Integrity, Ball State University, Muncie, IN, 47306, or irb@bsu.edu.

Researcher Contact Information
Denise K. Frazier, Department of Elementary Education
Ball State University, Muncie, Indiana 47306
dkfrazier@bsu.edu

Default Question Block

Do you use tablet computers in your teaching?

- ○ Yes, I use iPads.
- ○ Yes, I use another type of tablet (please specify).
- ○ Not at this time.

How many tablets/iPads do you have access to in your classroom?

- ○ Less than 10
- ○ 11-20
- ○ 21-30
- ○ More than 30

Please indicate how tablets/iPads were implemented in your school by selecting the relevant choices.

- ☐ I chose to implement iPads in my classroom.
- ☐ Administration told me to implement iPads in the curriculum.
- ☐ Administration asked for my opinion prior to iPad implementation.
- ☐ None of the above.

I have attended teacher professional development sessions for tablet/iPad use in my classroom.

- ○ Yes
- ○ No

The tablet/iPad professional development I have received has adequately prepared me to use it in my classroom.

- ○ Strongly Disagree
- ○ Disagree
- ○ Agree
- ○ Strongly Agree

I feel confident using a tablet/iPad in classroom instruction.

- ○ Strongly Disagree
- ○ Disagree
- ○ Agree
- ○ Strongly Agree

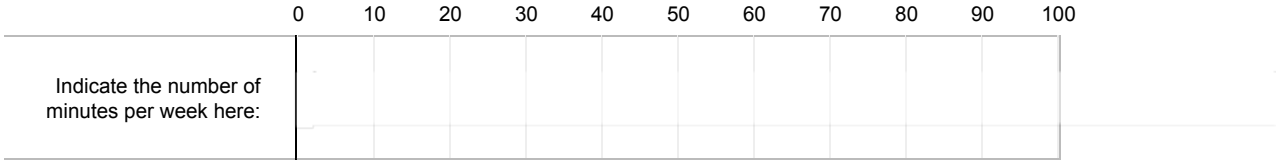
I use tablets/iPads for classroom instruction

- ○ 0-2 times per week
- ○ 3-5 times per week
- ○ 6-9 times per week
- ○ more than 10 times per week

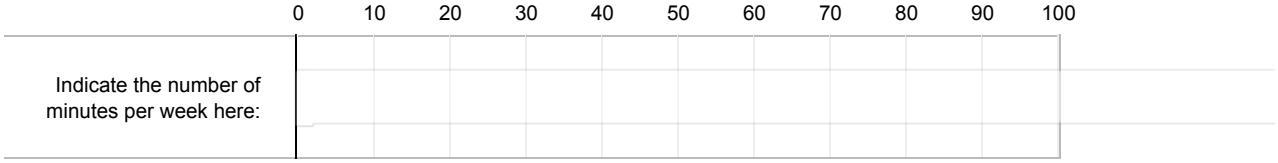
I have my students use their tablets/iPads during the following (check all that apply):

- ☐ language arts
- ☐ math
- ☐ social studies
- ☐ science
- ☐ other subject area (please specify below)
- ☐ None of the above.

How many minutes do your students spend reading teacher assigned social studies material on tablets/iPads, if any?



How many minutes do your students spend reading teacher assigned science material on tablets/iPads, if any?



In regard to language arts instruction, I use tablets/iPads to teach

Phonics	Word recognition	Vocabulary	Comprehension	Other (please specify)	None of the above
☐	☐	☐	☐	☐	☐

Please choose the best response (s) to describe the use of tablets/iPads in the classroom.

	Strongly Disagree	Disagree	Agree	Strongly Agree
I have my students use tablets/iPads for inquiry learning	○	○	○	○
I use tablets/iPads for classroom management	○	○	○	○
I find it difficult to supervise students' tablets/iPad use.	○	○	○	○
I use my tablet/iPad to assess learning.	○	○	○	○
I use the tablet/iPad to differentiate instruction (i.e. to support and challenge students)	○	○	○	○
I collaborate with colleagues through the use of my tablet/iPad.	○	○	○	○

Regardless of whether each student has their own tablet/iPad, my students use their tablets/iPads (please check all that apply)

- [ ] Individually
- [ ] In small groups (2-6 students)
- [ ] In large groups (7 or more students)
- [ ] None of the above.

Please check all that apply in regard to parents and tablets/iPads.

- [ ] I communicate with parents via the tablet/iPad.
- [ ] I share applications (apps) I use in the classroom with parents.
- [ ] Parents suggest apps that I may be able to use in the classroom.
- [ ] The tablet/iPad has strengthened the home/school connection.
- [ ] None of the above.

Please choose all of the responses that apply to your students and tablets/iPads.

	Strongly disagree	Disagree	Agree	Strongly Agree
My students are knowledgeable about the use of tablets/iPads.	○	○	○	○
My students have taught me about the tablet/iPad.	○	○	○	○
My students suggest apps for me to use in the classroom.	○	○	○	○
My students are motivated when using a tablet/ iPad.	○	○	○	○
My students are engaged (i.e. focused and interested) when using a tablet/iPad.	○	○	○	○
My students are distracted by tablets/iPads.	○	○	○	○
Tablets/iPads have helped my students learn.	○	○	○	○

Please comment on other ways you are using tablets/iPads in your classroom, or other issues not addressed in this survey.

Would you be willing to be contacted about this study or for follow up studies regarding tablets/iPads in the classroom? If yes, please include your name, email address, and phone number.

- ○ Yes, I am willing to allow you to contact me. My name, email address, and phone number are listed below.
- ○ No, I do not want to be contacted.

Demographics

How long (total years) have you been teaching?

- ○ 0-3 years
- ○ 4-7 years
- ○ 8-11 years
- ○ More than 11 years

What grade level do you currently teach?

- ○ Kindergarten
- ○ 1st grade
- ○ 2nd grade
- ○ Any other grade besides K, 1, or 2
- ○ Combination of grades (please specify grades)

Please indicate your age bracket.

- ○ 22-32 years old
- ○ 33-43 years old
- ○ 44-53 years old
- ○ 54 years or above

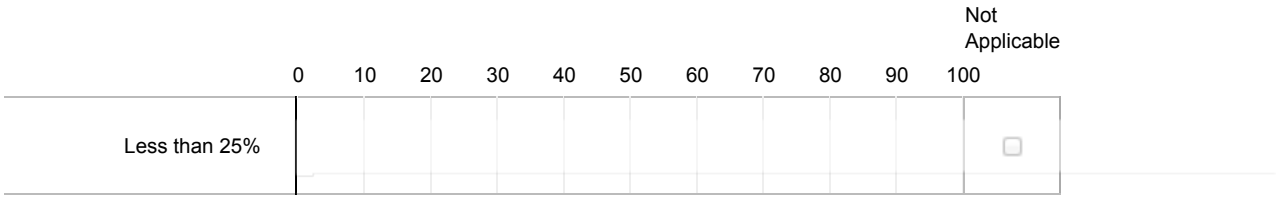
Choose all below that describe you.

- ☐ I use social media at least weekly (i.e. Facebook, Twitter, Instagram, Pinterest, etc.)
- ☐ I enjoy playing video games.
- ☐ I use a smartphone.
- ☐ I enjoy playing games on the computer and/or iPad.
- ☐ I use an iPad outside of my classroom.

What is your school demographic?

- Urban
- Rural
- Suburban
- Other

Using the slider below, please estimate the percentage of your school's free/reduced lunch population.



Block 2

Do you want access to results of this survey?

- Yes
- No

Appendix B

Survey items pertaining to each research question

Research Question #1 *Do kindergarten, 1st, and 2nd grade classroom teachers use iPads in classroom instruction?*	**Research Question #2** *When do K-2 teachers use iPads in classroom instruction?*	**Research Question #3** *How do K-2 teachers use iPads in classroom instruction?*	**Research Question #4** *How do K-2 teachers in a mid-western state perceive the use of iPads for classroom instruction?*
Q. 1 Do you use tablet computers in your teaching?	**Q. 8** I have my students use their iPads during the following (check all that apply-subjects)	**Q. 9** How many minutes do your students spend reading teacher assigned social studies material on iPads, if any?	**Q. 3:** Please indicate how iPads were implemented in your school.
Q. 2 How many iPads do you have in your classroom?	**Q. 11:** I use iPads to teach (check all that apply re: language arts: phonics, word recognition, vocabulary, comprehension, other, none of the above.	**Q. 10** How many minutes do your students spend reading teacher assigned science material on iPads, if any?	**Q. 4:** I have attended teacher professional development sessions for iPad use in my classroom.
Q. 7 I use iPads for classroom instruction (how often)	**Q. 14-2:** I share applications (apps) I use in the classroom with parents.	**Q. 12-1:** I have my students use iPads for inquiry learning	**Q. 5:** The iPad professional development I have received has adequately prepared me to use it in my classroom
		Q. 12-2: I use iPads for classroom management	**Q. 6:** I feel confident using an iPad in classroom instruction.
		Q. 12-5: I use the iPad to differentiate instruction (i.e. to support and challenge students)	**Q. 12-3:** I find it difficult to supervise students' iPad use.
		Q. 12-6: I collaborate with colleagues through the use of my iPad.	**Q. 14-3:** Parents suggest apps that I may be able to use in the classroom.
		Q. 13: Regardless of whether each student has their own iPad, my students use their iPads (please check all that apply)	**Q. 14-4:** The iPad has strengthened the home/school connection

		(individually, small grp, lg. grp)	
		Q. 14-1: I communicate with parents via the iPad.	**Q. 15-2:** My students have taught me about the iPad
		Q. 16: Please comment on other ways you are using the iPad in your classroom, or other issues not addressed in this survey.	**Q. 15-3:** My students suggest apps for me to use in the classroom.
			Q. 15-4: My students are motivated when using the iPad.
			Q. 15-5: My students are engaged (i.e. focused and interested) when using the iPad.
			Q. 15-6: My students are distracted by the iPad.
			Q. 15-7: The iPad has helped my students learn.
			Q. 12-4: I use my iPad to assess my students.
			Q. 15-1: My students are knowledgeable about eh use of tablets/iPads.

Appendix C

Survey Items Pertaining to Demographics

School/Classroom Demographics	Teacher Demographics
Q. 22: What is your school demographic?	**Q. 18:** How long (total years) have you been teaching?
Q. 23: Using the slider below, please estimate the percentage of your school's free/reduced lunch population.	**Q. 19:** What grade level do you teach?
Q. 21-1: I use social media at least weekly.	**Q. 24:** Do you want access to results of this survey?
Q. 21-2: I enjoy playing video games.	**Q. 20:** What is your age range?
Q. 21-3: I use a smartphone.	**Q. 17:** Would you be willing to be contacted about this study or for follow up studies regarding tablets/iPads in the classroom?
Q. 21-4: I enjoy playing games on the computer and/or iPad.	
Q. 21-5: I use an iPad outside of my classroom.	

APPENDIX D

Administrator Cover Letter

ADMINISTRATOR COVER LETTER

Dear Principal Smith,

With more administrators bringing iPads into their schools, it is important to examine teachers' perceptions of iPads, and how they are using them in their classrooms. The purpose of this study is to collect information on if, when, and how **will take less than five minutes** of your K-2 teachers' time to complete. The survey was sent directly to your K-2 teachers. However, if you would like a copy of the results of this survey, please fill in the information below, and reply back to me.

Thank you in advance for encouraging your K-2 teachers to complete the survey, and for replying to this email.

Sincerely,

Denise Frazier
Ball State University

_____ Yes, please email me the results of your survey entitled, Using iPads in Classroom Instruction.

_____ No, I am not interested in the results of your survey entitled, Using iPads in Classroom Instruction.

APPENDIX E

Teacher Cover Letter

TEACHER COVER LETTER

Dear Indiana K-2 teacher,

Many Indiana teachers are using iPads in their classroom instruction. It is important to know when and how iPads are being used, especially with young students. The purpose of this study is to collect information on if, when, and how Indiana K-2 teachers are using iPads in their classrooms.
This **very brief survey will take less than five minutes** of your time to complete. *In order to thank you for your time, a list of iPad resources, such as suggested education apps and links to professional development, will be provided to you upon the completion and submission of your survey.*
If you would like a copy of the results, please select the option at the end of the survey. More details of the study are included on the first page, along with a place to sign into the survey if you agree to participate. If you have any questions, please reply to this email.

Sincerely,

Denise Frazier
Ball State University

APPENDIX F

Survey Reminder Letters for Teachers

SURVEY REMINDER LETTER 1

Dear Indiana K-2 teacher,

One week ago, a survey was sent to you pertaining to Indiana K-2 teachers' use of iPads in classroom instruction. This information will be used to examine when and how teachers are using iPads in their K-2 classrooms.
I understand your time is valuable, and you are very busy. Therefore, I am sending this reminder. **This very brief survey will take less than five minutes to complete.** *In order to thank you for your time, a list of iPad resources, such as suggested educational apps and links to professional development, will be provided to you upon the completion and submission of your survey.*
Your input is very important to the outcome of this study. If you have any questions, I can be reached at dkfrazier@bsu.edu.

Thank you,

Denise Frazier
Ball State University

APPENDIX G

Survey Final Reminder Letter

SURVEY REMINDER LETTER 2

Dear Indiana K-2 teacher,

Two weeks ago, a survey was sent to you pertaining to Indiana K-2 teachers' use of iPads in classroom instruction. This information will be used to examine when and how teachers are using iPads in their K-2 classrooms.

I am sending this **final** reminder. This **very brief** survey will take **less than five minutes to complete.** *In order to receive the list of iPad resources you must complete and submit the survey.*
Your input is very important to the outcome of this study. If you have any questions, I can be reached at dkfrazier@bsu.edu.

Thank you,

Denise Frazier
Ball State University

APPENDIX H

iPad **iPad Resources** Resources for Teachers

Free and low cost professional development: Completing the Survey

http://www.doe.in.gov/elearning

The Indiana Department of Education has great resources for eLearning. This summer there are 19 conferences throughout the state at very reasonable prices (i.e. $30 for a two-day conference). I attended one last year and it was excellent, offering breakout sessions such as introducing iPads to your classroom and how to implement a flipped classroom.
http://www.doe.in.gov/elearning/professional-development

Take advantage of an outstanding, free professional learning opportunity through Five-Star Academy's online courses. Through a partnership with the Indiana Department of Education, Five-Star Technology Solutions is offering FOUR FREE seats to each corporation in the state! • Participants receive 40 PGP's upon completion of the course.

http://five-startech.com/k-12-education1/indiana-doe-partnership/2014courses

More resources on social media through the D.O.E. http://www.doe.in.gov/elearning/social-media

Recommended Free Apps by subject

Language Arts	Math	Science/Social Studies	For teachers	Other
Felt Board-Mother Goose on the Loose by Software Smoothie-good for retell, nursery rhymes Doodlebuddy-draw/sketch, retell with pictures	123D Catch-students take multiple pictures of an object, and it "sews" pics together to create a 3D picture, could use for science or to with 3D shapes for math	Leafsnap and Solar Walk-to carefully observe and identify specific multimodal or visual feature of a phenomenon in order to explain it.	Socrative-student response system that teachers use to engage their classrooms through a series of educational exercises	iMovie-fast and fun moviemaking app
Scholastic Storia-many book to read or listen to; a variety of genres Toontastic-draw/animate cartoons	myscript calculator-use your finger to write out questions and myscript gives the answer in decimal format, teachers or students can email complete problems for study purposes	The Frog Blog: 20 apps for science teachers	Nearpod-teachers create presentations and find content	Educreations-recordable white board
Bluster-rhyming app	Pick a Path-math symbols and line	Pocket pond 2-use this for teaching the ecosystem, feed the fish, clean the tank,	Evernote-helps keep teachers organized across devices	ShowMe or VoiceThread: students view the same image/video,

MadLibs-like the original, good for grammar practice		etc.		record comments to share
Aesop's Fables HD-provides a variety of Greek legends, fables, etc.	Khan Academy-math by grade levels and upper level math; recreational math i.e. brain teasers	newseum-includes newspapers from all around the world.	Dropbox-collect and share photos, docs, and videos	Diigo: students use to take notes and share with others. Can clip or record notes.
Trading cards: use this app to aid in students' writing to allow them to demonstrate their comprehension	Math Ninja-simple drill, but young elementary students are motivated by it	shake-em-to use with state capitals, literally shake the iPad to choose another state	ClassDojo-classroom management	MindMeister for iPad, Popplet Lite, Sundry Notes-use for concept maps
Word mover: allows students to create poetry by choosing from word banks and existing famous works	http://freeappfriday.com/category/this-weeks-free-apps/march-28-2014/ This site features a free app every Friday. This one is a math app, but the archive has a variety of free apps.	Stack the Countries-fun way to learn geography, however, $1.99; Stack the States is .99	join.me-whatever is on your computer will show up on kids's iPads, you are assigned a code for your information to be presented, kids enter the code, and what you want them to see is on their iPad	Prezi for iPad

Some of the above apps were found at:

http://www.educatorstechnology.com/2013/09/8-must-have-ipad-apps-to-boost-students.html

http://teacherswithapps.com/ (teachers review apps, not all of these are free)

http://www.readwritethink.org/classroom-resources/mobile-apps

Appendix I

Table 3: Items and statistics

Descriptive (nominal data)	Relationships (Pearson r)
Do you use tablet computers in your teaching?	I have my students use iPads for inquiry learning.
How many iPads do you have in your classroom?	I use iPads for classroom management.
I use iPads for classroom instruction (how often).	I use the iPad to differentiate instruction (i.e. to support and challenge students)
I have my students use their iPads during the following (check all that apply-subjects)	I collaborate with colleagues through the use of my iPad.
I use iPads to teach (check all that apply): language arts, phonics word recognition, vocabulary, comprehension, other, none of the above.	Please comment on other ways you are using the iPad in your classroom, or other issues not addressed in this survey.
I use my iPad to assess my students.	What is your school demographic?
I share with parents applications (apps) I use in the classroom.	Using the slider below, please estimate the percentage of your school's free/reduced lunch population.
How many minutes do your students spend reading teacher assigned social studies material on iPads, if any?	I have attended teacher professional development sessions for iPad use in my classroom.
How many minutes do your students spend reading teacher assigned science material on iPads, if any?	The iPad professional development I have received has adequately prepared me to use it in my classroom.
Regardless of whether each student has their own iPad, my students use their iPads (check all that apply).	I feel confident using an iPad in classroom instruction.
I communicate with parents via the iPad.	The iPad has strengthened home/school connection.
Please indicate how iPads were implemented in your school.	My students have taught me about the iPad.
I find it difficult to supervise students' iPad use.	My students are motivated with using the iPad.
Parents suggest apps that I may be able to use in the classroom.	My students are engaged (i.e. focused and interested) when using the iPad.
My students suggest apps for me to use in the classroom.	My students are distracted by the iPad.
Do you want access to results of this survey?	What is your age range?
	What grade level do you teach?

	The iPad has helped my students learn.
	Choose all that describe you.

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